Asian Institute of Technology
RESEARCH

AIT
Asian Institute of Technology

Contents

COVER PHOTO
by Aadit Shrestha

Himalayas: AIT's RS & GIS team and researchers from Japan's Keio University work together to monitor glacial lake outbursts in order to warn and mobilize possible affected communities of catastrophic floods by applying Ubiquitous Geo-Informatics and sensor technologies.

Professor Said Irandoust
President
Asian Institute of Technology

As the leading network institution in the region, the Asian Institute of Technology (AIT) has always been in the forefront in initiating new ventures. While celebrating the Golden Jubilee of the Institute, we take pride in the fact that we have been contributing to the development of Asia for the past 50 years. For half a century, we have been developing and sharing knowledge, and helping in capacity building in the region.

AIT is now venturing into a new landscape for higher learning. The new concepts on which AIT seeks to focus are partnership, networking, efficiency, innovation and value creation. Higher learning is facing immense challenges due to rapid changes, complex environment, new technology and tight competition. We are also very fortunate to be situated at the very epicenter of growth. The maximum potential of growth in higher learning lies in Asia, and AIT is ideally situated to benefit from it. The other region of growth is Africa, where AIT will utilize its capacity building potential to develop and share knowledge.

AIT has already embarked upon a new strategy as enunciated in our Strategy Document 2009-2013. We are positioning the Institute under the umbrella research area of "Sustainable Development in the context of Climate Change". The four strategic themes that we have identified include our endeavor to be a premier regional network institute; maintain excellence and relevance in Education, Research and Outreach, focus on positioning and branding as well as developing a stronger base for research and development.

As we move into the next 50 years, we seek to build on our foundations of good teaching and learning as well as excellent research. Our research skills have been the cornerstone of our success, which ensures that the AIT remains a magnet for International Organizations and institutions of higher learning, when it comes to partnerships in education, research and development and outreach activities. The research document which is before you provides a sampling of the work that AIT is currently engaged in. This document helps AIT to reach out to the outside world to share the advances they have made in their respective fields, apart from helping the outside world discover them as well.

This document is just the tip of the iceberg when it comes to the research being conducted at AIT. But for us, it is a starting point for new ventures, fresh ideas and a resolve towards excellence as we move into the next 50 years of our existence.

Professor Sudip K. Rakshit
Vice President for Research
Asian Institute of Technology

Research at AIT is premised on the application of highly complex fields of technological inquiry towards achieving sustainable development solutions for the region. AIT aims to lead the region as a centre for knowledge, development, research and development activity and is creating specific niche areas for itself.

To achieve this ambition, AIT is consolidating all of its research efforts under a single thematic knowledge umbrella called: "Sustainable Development in the context of Climate Change". This endeavor will be supported by a critical mass of researchers whose work will focus under six thematic knowledge sub-areas, namely: Vulnerability and Disaster Risk Reduction, Water Resources and Coastal Adaptation , Urban and Rural Sustainability, Low Carbon Society and Renewable Technology, and Cleaner Production and Waste Refinery.

Today, the importance of transdisciplinary and collaborative research cannot be underestimated. AIT can serve as a common neutral platform for private sector, government and public institutions, local communities and other stakeholders to bond together in common purpose and work towards poverty alleviation and a better quality of life for everyone in the region.

Our plan is to identify and support new technologies, products, and services that have high impact potential as small or medium scale enterprise; to promote innovative and original research ideas and to inculcate a spirit of entrepreneurship within all aspects of AIT's academic education and research activity.

The Institute will stess a proactive approach in terms of scoping opportunities for research and development both at local and regional levels. It aims to serve as a centre for technology transfer and diffusion, as well as for the development of best practices and the dissemination of knowledge. A professional unit is being developed to assess the market and carry out projects in a professional manner. Key Performance Indicators (KPI) for research are also being developed which will take into account the quality of publications, the number, type and impact of sponsored research in terms of strengthening all research conducted at AIT.

Through our interdisciplinary teams, the injection of funds for better infrastructure, targetted support and incentives for faculty and scientific staff, greater networking and collaboration with partners, entrepreneurship and innovation, AIT's research will continue to grow from strength to strength.

Preface

This publication on research at the Asian Institute of Technology is a first in many ways.

***Asian Institute of Technology Research* is a comprehensive overview of the ongoing research conducted within each field of study at AIT, and highlights the leading expertise and interests of our faculty and scientists.**

This is the first time that AIT's research has been presented under the thematic umbrella of "Sustainable Development in the context of Climate Change" (SDCC). The six key thematic knowledge sub-areas are an integral part of this publication, and are directing the sponsored projects and research activities of the Institute.

The multidisciplinary research interests and expertise of AIT's faculty and staff illustrate our growing critical mass of professionals committed to exploring sustainable development solutions and addressing issues concerning global climate change.

Through the Institute's focused research activities and new strategic directions, AIT continues its dedicated service to the region in partnership with like-minded stakeholders in the public and private sectors.

This is also the first time that AIT has produced a thoroughly environmentally friendly publication, through SCG Paper's generous contribution of EcoFiber Products and the use of soy ink for printing.

***Asian Institute of Technology Research* is also produced on the occasion of AIT's 50th Anniversary and is a testament to the Institute's rich legacy of research excellence and to its future ambition to impact Asia and the world with innovative and beneficial research solutions.**

Thematic Knowledge Area on Sustainable Development in the Context of Climate Change

Thematic Sub-areas

1. Vulnerability and Risk Reduction
2. Water Resources and Coastal Adaptation
3. Urban and Rural Sustainability
4. Low Carbon Society and Renewable Technology
5. Agriculture, Land Use and Forestry
6. Cleaner Production and Waste Refinery

Vulnerability and Risk Reduction

Disasters undermine development gains and contribute to increased vulnerability. According to World Bank studies, total global annual economic loss caused by natural disasters goes up to USD 54 billion per annum. Asia's loss to infrastructure investment in the 1990s amounted to USD 10 billion per year. With 903 million people living below the poverty threshold (ADB, 2009), Asian people are more vulnerable than ever to disasters and climate change impacts.

However, recent successes in mitigating impacts of natural events, such as reducing loss of lives during the cyclones in Bangladesh, have demonstrated the effectiveness of disaster preparedness. AIT believes that the success of some countries can be replicated. Strengthening the capacity of stakeholders is a key element in disaster preparedness and vulnerability reduction. AIT commits to increasing regional capacity in disaster preparedness and adaptation even as it addresses other issues of vulnerability, including the poor's access to resources and services.

Through its research and academic programs, AIT has been engaged in this thematic research area. Research projects include, among others, designing and applying innovative technologies during post-tsunami reconstruction, monitoring glacier lake outburst flooding in the Himalayas and installing Early Warning Systems (EWS), developing appropriate multi-hazard vulnerability and risk assessments, applying community-centered processes in disaster management, and identifying knowledge gaps and research issues in climate adaptation. The Institute runs an interdisciplinary program on disaster preparedness, mitigation and management with regional and international partners such as UN Office for the Coordination of Humanitarian Affairs (UNOCHA), Asian Disaster Preparedness Center (ADPC), International Institute for Geo-Information Science and Earth Observation (ITC), National Oceanic and Atmospheric Administration (NOAA), and International Center for Urban Safety Engineering (ICUS) that aims to increase capacity in disaster risk reduction.

Experts

Dr. Pennung Warnitchai	Earthquake Engineering
Prof. Ajit P. Annachhatre	Health and Ecological Risk Management
Dr. Mokbul Morshed Ahmad	Regional and Rural Development Planning
Dr. Amrit Bart	Coastal Resiliency and Disaster Preparedness
Dr. Mukand Singh Babel	Drought Forecasting and Management
Prof. Dennes T. Bergado	Geotechnical and Geoenvironmental Engineering Landslide Risk Management
Dr. Pham Huy Giao	Geotechnical and Geoenvironmental Engineering
Dr. Bonaventura H. W. Hadikusumo	Construction Site Safety
Dr. Kiyoshi Honda	Real-time Mapping and Simulation of Geological Processes
Dr. Kyoko Kusakabe	Community Based Disaster Risk Management and Gender Issues
Prof. Worsak Kanok-Nukulchai	Structural Engineering
Dr. Noppadol Phien-wej	Geological Hazards and Risk Assessments
Prof. Jayant K. Routray	Regional and Rural Development Planning
Dr. Edsel Sajor	Urban Environmental Management
Dr. Lal Samarakoon	Geospatial Technology for Disaster Management Geospatial Technologies for Disaster Risk Reduction
Dr. Manzul K. Hazarika	Geospatial Technologies for Disaster Risk Reduction
Prof. Tawatchai Tingsanchali	Flood Disaster Management
Dr. Sutat Weesakul	Tsunami and Coastal Engineering
Dr. Vivarad Phonekeo	Automatic Near Real-time MODIS Processing for Active Fire and Thermal Anomalies Monitoring

Water Resources and Coastal Adaptation

Water is a vital resource that sustains life and growth. Yet tremendous pressures on the use and management of water, such as demography and climate change, are pushing the resource's threshold to the breaking point. Coastal adaptation is a key aspect of a holistic strategy for improving efficiency in using and managing water to keep the hydrological cycle in balance towards healthy land-water ecosystems and food security.

Water Engineering and Management is the pioneer programme at AIT. Equipped with modern equipment and facilities, the Institute is able to conduct extensive work in the areas of agricultural water, coastal water, urban water, water resources, and extreme events, such as floods and droughts, and risk management within the framework of integrated water resources management. Some recent projects include water and sediment management, water vulnerability assessments, coastal resiliency studies, aquaculture resources and wetland management, and climate change impacts to water resources and coastal communities. Recently, AIT led a multidisciplinary team of experts engaged by the World Bank to carry out climate change impact and adaptation study in the Bangkok Metropolitan Region. Water-related studies are a strong cross-cutting theme in the multidisciplinary approach that the Institute adopts in analyzing sustainable development and climate change issues.

The Institute's network of partners and collaborators have provided a broad platform for engagement in water policy and practice. Through the Wetland Alliance Program, AIT strengthens local capacity for sustainable wetlands management. The Institute works with 30 local partners and international partners to improve the livelihoods and food security of the poor based on improved management of wetlands and aquatic resources. In another project with the United Nations Environment Programme (UNEP), the AIT research team have identified key threats to water resources development and management in the region, and assessed the challenges in addressing these threats. A double degree programme on Urban Water Engineering and Management, a collaborative effort by AIT and UNESCO-Institute for Water Education (IHE), started in August 2009.

Experts

Dr. Mukand Singh Babel	Water Engineering and Management
Prof. Ajit P. Annachhatre	Environmental Engineering and Management
Dr. R.S. Clemente	Water Engineering and Management
Dr. Wenresti Glino Gallardo	Coastal Resources Management
Dr. Theo Ebbers	Aqua Outreach Programme
Dr. Thammarat Koottatep	Environmental Engineering and Management
Dr. Vilas Nitivattananon	Water Supply and Sanitation
Dr. Preeda Parkpian	Environmental Engineering and Management
Dr. Sylvain Perret	Water Resources Economics and Management
Dr. Lal Samarakoon	Remote Sensing and Geographic Information Systems
Prof. Ganesh Shivakoti	Agricultural and Natural Resource Economics
Dr. Oleg Shipin	Environmental Engineering and Management
Dr. Rajendra Shrestha	Natural Resources Management
Dr. Chanon Thaicharoen	Water Engineering and Management
Dr. Dhirendra P. Thakur	Intensive Aquaculture and Water Quality and Nutrient Dynamics
Dr. Amararatne Yakupitiyage	Aquaculture and Aquatic Resources Management
Dr. Shahriar M. Wahid	Water Engineering and Management
Dr. Sutat Weesakul	Water Engineering and Management
Dr. Chucheep Wongsupap	Water Engineering and Management

Urban and Rural Sustainability

It is clear to AIT that at present rural and urban development processes are not sufficiently sustainable. In the next 25 years, urban population will have increased by 55% while the rural sector will have shrunk by 3%. In the same time span, an unprecedented urban population increase of 66% in developing countries will have occurred in Asia which is approximately about 44 million more people in the cities per year (Urbanization and Sustainability in Asia, 2006). Considering the present state of facilities and services of many cities in the world, the basic needs of populations will not be met adequately and further compound the current problems faced by cities.

AIT believes that understanding rural-urban interaction across sectors and space is integral to achieving a balanced and sustained development. This interaction also influences how natural resources are utilized and what livelihoods are tenable. Ensuring the sustainability of urban and rural development processes contributes to a more robust economy and environment that are essential elements in building societies resilient to climate change impacts. Urbanization differs between countries and even within countries in Asia. Keeping a localized strategic approach in managing the urbanization process with a broad outlook at sustainability issues is a key feature in AIT's approach towards effectively responding to the challenges in this subject area.

The Institute's strategy covers a wide range of initiatives but is always attuned to local problems and perspectives in a given context. AIT focuses on assisting stakeholders build their capacity to promote urban and rural sustainability through appropriate technology, relevant and applied research, sustainable frameworks for development and planning, informed policy making and practice applications in the region. The Southeast Asia Urban Environmental Management Applications (SEA-UEMA) Project implemented in 2003 was launched to tackle emerging problems in the cities in Thailand, Indonesia, Cambodia, Lao PDR, Vietnam and in the Philippines. It has entered a period of consolidation to integrate lessons learned from joint action research, demonstration and pilot projects, and to strengthen partnerships in the region. Some of the projects focus on air quality, water and sanitation, solid waste management, cleaner technology and micro-industries. Gender is an important cross-cutting framework in analyzing sustainability issues.

Experts

Dr. Edsel Sajor	Urban Environment and Sustainable Development
Dr. Mokbul Morshed Ahmad	Regional and Rural Development Planning
Dr. Philippe Doneys	Gender and Development Studies
Dr. Kyoko Kusakabe	Gender and Development Studies
Dr. Vilas Nitivattananon	Urban Environmental Management
Prof. Worsak Kanok-Nukulchai	Structural Engineering
Dr. Kunnawee Kanitpong	Transportation Engineering
Dr. Soparth Pongquan	Rural Development
Dr. Ranjith Perera	Urban Environment
Dr. Bernadette P. Resurreccion	Gender and Development Studies
Prof. Jayant K. Routray	Regional and Rural Development Planning
Dr. Paul Janecek	Information Management and Development

Low Carbon Society and Renewable Technology

Greenhouse gas (GHG) mitigation options (both technological and policy) and their implications for the energy resource mix, technology-mix, environmental and develomental co-benefits in terms of reduction of other pollutant emissions, is a major focus of research at AIT. The Institute has assisted in national energy system and policy modeling in Thailand, Vietnam and Indonesia. These models are designed to capture the energy demand and technology characteristics of different economic sectors as well as the possible technology and energy resource options. Similar modeling activities in the case of Cambodia, Lao PDR and Myanmar are ongoing. For several years now, AIT has developed strong collaboration with the Asia-Pacific Integrated Assessment Modeling (AIM) team in Japan to develop both the bottom-up and top-down models of selected countries in South-East Asia for integrated assessment of climate change policies.

AIT has been engaged in substantial research on low carbon and renewable technologies. The Asian Regional Research Programme in Energy, Environment and Climate (ARRPEEC) is a regional network involving 22 National Research Institutes (NRIs) from seven countries of Asia. The project produced policy outputs in the areas of energy, environment and climate research; mobilize and enhance capacity of the NRIs; dissemination of results among policy personnel; and linkage of project activities with national, regional and global initiatives to reduce GHG and other hazardous emissions. The Swedish International Development Cooperation Agency (Sida) supported the project during 1995 - 2005. The project involved four regional research projects, namely: 1) Biomass Energy in Asia: Assessment and Strategy Formulation; 2) Small and Medium Scale Industries in Asia: Energy, Environment and Climate Interrelation; 3) Strategies for Promotion of Energy Efficient and Cleaner Technologies in the Urban Transport System, and; 4) Strategies for Promotion of Energy Efficient and Cleaner Technologies in the Power Sector. In addition to conducting research projects, ARRPEEC also had a fellowship scheme to enable senior researchers from the countries involved to carry out research and update their knowledge in field of Energy, Environment and Climate.

The Renewable Energy Technologies (RETs) in Asia was a regional research and dissemination programme to promote renewable energy technologies in six Asian countries involving thirteen institutions in South and South-East Asia. Project activities focused on adaptive research and demonstration of the appropriate renewable technologies suitable to the local condition as well as dissemination. Three renewable energy technologies are selected for adaptive research and dissemination: Solar photovoltaics, Solar and biomass-based drying, and Biomass briquetting and briquette-fired stoves. Sida supported the project during 1996-2005. Technology packages, demonstration, case studies and lessons learnt have been documented under this programme.

The Institute also facilitated a project that transfers European wind energy technology called "Transfer of EU Knowledge and Technology for Development of Wind Energy Technology in Thailand". The objective of the project is to promote the wind energy sector in Thailand with the transfer of knowledge and technology from the EU and to support the Thai government's movement toward greater energy security, diversity and independence.

Other recent undertakings include cooperation and technology transfer projects to promote low carbon societies and renewable technology. With the Embassy of Finland, AIT is engaged in a cooperation programme with governments and different local private sector actors in the Mekong River basin countries to help strengthen the use of renewable energy, enhance the mitigation of climate change and increase regional public-private partnerships in the field of renewable energy.

The Energy group at AIT has been recognised as one of the eight centres of excellence in the Global Network on Energy for Sustainable Development (GNESD), a Type II alliance formed after the Johannesburg Summit (2002) coordinated by the UNEP Risoe Centre. Thematic studies have been carried out in the area of energy access, renewable energy technologies, urban and peri urban energy access. The ongoing thematic studies are on energy security and bioenergy.

Research and capacity building activities have been carried out on Clean Development Mechanism, specifically with Cambodia, the Philippines, Vietnam and Thailand.

Experts

Prof. Sivanappan Kumar	Renewable Energy, Energy and Sustainable Development, Energy and Environment
Prof. Ram Manohar Shrestha	Energy and Environmental Policy Energy Economics
Prof. Nazrul Islam	Management of Technology
Dr. Charles Marpaung	Energy Economics
Dr. Nadarajah Mithulananthan	Energy
Dr. Brahmanand Mohanty	Rational Use of Energy
Dr. Mokbul Morshed Ahmad	Energy and Rural Development
Dr. Nguyen Thi Kim Oanh	Air Pollution
Dr. Ranjith Perera	Urban Environment
Dr. Shreekar Pradhan	Energy
Prof. Sudip K. Rakshit	Biofuels and Bioprocess Technology
Dr. Abdul Salam	Biomass Energy
Dr. Rajendra Shrestha	Natural Resources Management

Agriculture, Land Use and Forestry

Croplands, pasturelands and forests comprise around 40-50% of the earth's surface (Intergovernmental Panel on Climate Change, 2007). However, climatic patterns as well as the spatial distribution of agro-ecological zones and habitats change rapidly altering the quality and quantity of land, soil and water resources. The FAO Committee on Food Security reported in 2005 that around 11% of arable land in developing countries could be affected by climate change (FAO, 2007). Agriculture and forestry share mitigation efforts towards reduction of total anthropogenic GHG emissions where both sectors bear the impacts of global change, population growth and changing land use patterns.

The Asian Institute of Technology believes that comprehensive mitigation measures in the midst of growing demand for food and forest resources have to simultaneously target the agriculture and forestry sectors. This is important considering that the fastest growing populations come from developing countries in the tropics where demand for food production continues to increase. Recognizing that agriculture is the major form of land use in tropical and subtropical continents, AIT pursues fields of expertise that enhance the capacities of people working in these sectors, encourage afforestation and improve land cover and tillage management towards achieving social, economic and environmental goals.

AIT conducts on-going research on climate change and land use with emphasis on agriculture and forestry. Some of the research activities involve assessing the carbon stock of soils and vegetation of the agricultural landscape. Other studies examine the relation of impact of land use change and climate on water resources, land degradation, and agricultural productivity. The Institute has conducted regional knowledge exchange based on successful field demonstrations on System of Rice Intensification (SRI). Another notable research on this thematic sub-area is the assessment of methane emission from rice paddies in Thailand. It involves the measurement of methane flux from rice paddies at different stages, lakes and wetlands, as well as an assessment of annual climate forcing due to open rice straw burning in South-East Asia. AIT continues to carry out research where stakeholder participation and local partnerships form part of overall adaptation policy measures in agriculture and forestry.

Experts

Dr. Amararatne Yakupitiyage	Aquaculture and Aquatic Resources Management
Dr. Sylvain Perret	Water Resources Economics and Management
Dr. Mokbul Morshed Ahmad	Regional and Rural Development Planning
Dr. Roland Cochard	Natural Resources Management
Dr. Wenresti Glino Gallardo	Farming Systems and Ecology
Dr. Anil Kumar Anal	Agriculture and Food Biotechnology
Dr. Prabhat Kumar	Sustainable Agriculture
Dr. Abha Mishra	Agricultural Systems, Sustainable Agricultural Intensification
Dr. Soparth Pongquan	Regional and Rural Development Planning
Dr. S. L. Ranamukhaarachchi	Agricultural Systems and Agronomy
Prof. Jayant Kumar Routray	Regional and Rural Development Planning
Prof. Vilas M. Salokhe	Protected Cultivation and Greenhouse Technology
Dr. Dietrich Schmidt-Vogt	Forest Ecology and Forest Management
Prof. Ganesh P. Shivakoti	Agricultural and Natural Resource Economics
Dr. Rajendra Prasad Shrestha	Land Evaluation and Management
Dr. Peeyush Soni	Energy and Agriculture
Dr. Dhirendra P. Thakur	Intensive Aquaculture and Water Quality and Nutrient Dynamics
Prof. Gopal Thapa	Sustainable Agricultural Development and Planning

Cleaner Production and Waste Refinery

Current trends in population growth, industrialization and natural resources consumption have seen wastes and pollutants released faster than the earth can absorb them and be restored. Urban and industrial areas are affected by water pollution and by high levels of air pollution. It is imperative that measures to minimize and control pollution need to be undertaken urgently through the prevention of pollution and waste generation at the source of production. Cleaner Production (CP) is the continuous application of an integration of preventative environmental and business strategies for procuring resources, producing and processing products, and/or providing services at higher efficiency, increased profitability, and at reduced risks to the environment.

AIT's offerings and expertise focus on capacity building and research. Past experience in the region reveals that capacity building in cleaner production was designed and implemented either in an ad-hoc basis or was focused on training the specialists. CP training activities should not only be limited to the training of specialists, but also reach out to the various cross sections of future technicians and planners.

CP concepts in traditional academic programs are limited to few institutions in this region. In January 2000, AIT introduced an interdisciplinary postgraduate program in "Cleaner Production" with support from UNEP. This program helps professionals who are in the fields of energy, environment, management, planning, process integration fields towards sustainable development and climate change mitigation activities.

A large number of activities have been carried out on CP by faculty, staff and students at AIT through student and sponsored research on activities involving treatment of wastes, improving energy efficiency through energy and environmental audits.

The Asian Regional Research Program in Energy, Environment and Climate (ARRPEEC) is a regional network involving 22 national research institutes from seven Asian countries. Funded by the Swedish International Development Cooperation Agency (Sida), and coordinated by the Asian Institute of Technology (AIT). Since 1991, research through ARRPEEC has focused on various areas including energy-efficient and environmentally sound industrial technologies, assessment of energy efficiency options, small and medium scale industry's energy, environment and climate interactions, biomass fuels, and energy efficient and cleaner technologies in the urban transport system. Tea, desiccated coconut, foundry, textile, brick manufacturing, cement, pulp and paper are some examples where cleaner productions options have been studied. These have contributed to new climate change interaction knowledge and understanding both to the industry and the research teams. Energy efficiency improvement, material efficiency improvement and reduced material consumption resulting in greenhouse gas reductions are notable benefits from the cleaner production research.

Extensive research on waste management has been carried out at AIT through the Asian Regional Research Program on Environmental Technology (ARRPET) involving 18 National Research Institutions from 8 Asian countries. Wastewater, Solid Waste, Hazardous Waste and Air Quality are the focus areas where ARRPET conducted climate change research as an integral component among other issues. The solid waste group of ARRPET was involved in technology development for Anaerobic Digestion of municipal solid waste, a potential area for trapping greenhouse gases. Other groups had climate change and GHG mitigation as key component in the research.

The recent project, 3R Knowledge Hub, implemented by the Asian Development Bank and jointly hosted by AIT and UNEP Regional Resource Center for Asia and the Pacific (RRC.AP), has been promoting waste reduction, reuse and recycle in Asian countries. Working on the upstream production and consumption sectors, 3R Knowledge Hub has generated knowledge and information on GHG reduction potential by promoting a reduce, reuse and recycle culture among the global citizens. Research on the downstream waste disposal side, and upstream waste reduction, reuse and recycle in tandem form a waste refinery (Integrated Solid Waste Management).

Experts

Prof. Chettiyappan Visvanathan	Cleaner Production, Industrial Pollution and 3R
Prof. Ajit Annachhatre	Water pollution
Ir. Erik Lucas Julien Bohez	Industrial Systems Engineering
Dr. Barbara Igel	Management of Technology
Dr. Thammarat Koottatep	Decentralized Waste and Wastewater Treatment Systems
Prof. Sivanappan Kumar	Energy and Cleaner Production
Prof. Ram Manohar Shrestha	Energy
Dr. Mousa M. Nazhad	Pulp and Paper Technology
Prof. Athapol Noomhorm	Food Processing
Dr. Nguyen Thi Kim Oanh	Air Pollution
Dr. Preeda Parkpian	Ecotoxicology, Heavy Metals
Dr. Ranjith Perera	Urban Environment
Prof. Sudip K. Rakshit	Biofuels and Bioprocess Technology
Dr. Bernadette Resurreccion	Gender and Development Studies
Prof. Jayant Routray	Rural Development
Dr. Edsel Sajor	Urban Environment
Prof. Vilas Salokhe	Agricultural Systems and Engineering
Dr. Rajendra Shrestha	Natural Resources Management
Dr. Weerakorn Ongsakul	Energy and Power Systems, Parallel Processing Applications

Research Areas in the Field of Studies

Agricultural Systems and Engineering
Aquaculture and Aquatic Resources Management
Computer Science and Information Management
Construction, Engineering and Infrastructure Management
Energy
Environmental Engineering and Management
Food Engineering and Bioprocess Technology
Gender and Development Studies
Geotechnical and Geoenvironmental Engineering
Industrial and Manufacturing Engineering
Mechatronics and Microelectronics
Natural Resources Management
Pulp and Paper Technology
Regional and Rural Development Planning
Remote Sensing and Geographic Information Systems
School of Management
Structural Engineering
Telecommunications
Transportation Engineering
Urban Environmental Management
Water Engineering and Management

Agricultural Systems and Engineering

By employing a holistic approach to research, AIT's Agricultural Systems and Engineering (ASE) field of study spearheads and specializes in work on sustainable agriculture, technology development for efficient food production and processing, and utilization of biological materials. One vital thrust of ASE involves the continuous work on forecasting possible influences to agricultural engineering development in the region.

Current /Recent Research

Precision Farming and Systems Analysis for Agriculture

Thailand, Mongolia, Nepal, Lao PDR, Rwanda and Cambodia

Harnessing precision agriculture for site-specific solutions to agricultural issues is essential to environmental, social and economical sustainability. Through the systems approach, ASE is known for exhaustive analysis on agricultural techniques including land suitability analysis and management, soil fertility assessment, variable rate technology, management zone based soil moisture conservation and irrigation scheduling, sustainable rice production, soil and crop data mapping, low altitude remote sensing using remote-controlled helicopter, agricultural residue utilization, optimization of sugarcane supply system and farming system with farm ponds and queuing theory for sugarcane unloading system.

Controlled Environment Agriculture and Farm Machinery

Germany and Thailand

Sustainable vegetable production in humid tropical climates under controlled environmental conditions is another expert area of ASE. Controlled Environment Agriculture (CEA) is an advanced and intensive form of hydroponically-based agriculture. Unique techniques that are applicable to the Asian contexts are continuously being refined. These systems demand sound knowledge of chemistry, horticulture, engineering, plant physiology, plant pathology, computers and entomology. Anticipated results include the advancement of greenhouse microclimatic studies, irrigation and fertilization, soil-less culture, nutrient recycling system, effects of UV on microclimate, evaporative cooling and insect aviation.

Farm Power and Human Factors Engineering

Thailand, Nepal, Indonesia and Bangladesh

Efficient, effective and innovative designs of specialized machinery and power units for agricultural mechanization, and its repair and maintenance, is a key forte for AIT. Studies on the implications of mechanical and animal power and the possible reversion to human power are prioritized.

ASE research includes experimentation on multipurpose cultivators, cage wheel performance, tillage studies, soil compaction modeling and grain yield, dynamic wheel-soil interaction simulation using Distinct Element Method (DEM), coconut oil extraction system using micro expelling method, cassava planter, high speed rotator, axial flow soybean combine harvester, biomimetics, wear characteristics of tillage tools, supercharger for diesel engines, venturi aerators for aquaculture ponds, mechanical and Infrared rotary tea dryers, nano surface coatings on tillage tools, modeling tractor performance of pneumatic tires, seat suspension system for tractors, vibration characteristics of tractors, rotary cultivators, and brush cutters.

Future Research Areas

- Low-cost agricultural equipment design and development
- Energy in agriculture
- Greenhouse microclimate control
- Sustainable agricultural production
- Farm machinery and power for small holders' agriculture

Partnerships

- Bangladesh Agricultural University, Bangladesh
- Jilin University, China
- China Agricultural University, China
- Southern Yangtsu University, China
- Vitus Bering, Denmark
- Hame Polytechnic, Finland
- University of Hanover, Germany
- University of Kassel, Germany
- Gajah Mada University, Indonesia
- Insitute Pertanian Bogor, Indonesia
- Jember University, Indonesia
- Andalas University, Indonesia
- Center for Agricultural Machinery Development, Indonesia
- Central Institute of Agricultural Engineering, India
- Shivaji University, India
- Allahabad Agricultural Institute, Deemed University India
- Sir Padampat Singhania University, India
- Mie University, Japan
- Kyoto University, Japan
- Hokkaido University, Japan
- Tribhuvan University, Nepal
- Stichting Holding Van Hall Larenstein, The Netherlands
- Phil Rice, Philippines
- International Rice Research Institute, Philippines
- Universidad Politecnica de Valencia, Spain
- Peradeniya University, Sri Lanka
- University of Rahuna, Sri Lanka
- Kasetsart University, Thailand
- Khon Kaen University, Thailand
- Rajamangala Institute of Technology, Thailand
- Suranaree University, Thailand
- Silsoe Research Institute, UK
- Sheffield Hallem University, UK
- Harper Adams University, UK
- Kansas State University, USA
- Michigan State University, USA
- Agricultural Research Services (USDA-ARS), USA
- Vietnam Institute of Agricultural Engineering (VIAE), Vietnam

Contact

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ASE Specialization

- Terramechanics
- Tillage and Traction
- Development of Agricultural Machines
- Cropping Systems
- Crop Ecophysiology and Modeling
- Stress Physiology - Plant Water Stress
- Design and Development of Agricultural and Processing Equipment
- Precision Agriculture
- Bio-energy Generation and Utilization
- Sustainable Agriculture
- Integrated Pest Management
- Agricultural Systems
- Agricultural Development and Policy Analysis
- Resource Development
- Farming Systems

Agricultural Systems and Engineering

Faculty & Research Staff	Research Interests
Prof. Vilas M. Salokhe *Coordinator* salokhe@ait.asia	Terramechanics Tillage and Traction Development of Agricultural Machines Ergonomics Applied Instrumentation Controlled Environment Agriculture Agricultural Automation and Mechanized Farming Low-cost Site-specific Technology
Dr. S. L. Ranamukhaarachchi ranamuka@ait.asia	Cropping Systems Crop Ecophysiology and modeling Stress Physiology - plant water stress Agronomic Research - weed science, soil fertility management Integrated Pest Management Ecological Agriculture and Organic Farming and Watershed Development and Management Research
Dr. Po-Yung Lai laipoyung@ait.asia	Sustainable Agriculture Integrated Pest Management Agricultural Systems
Prof. Ganesh P. Shivakoti ganesh@ait.asia	Agricultural Development and Policy Analysis Resource Development Farming Systems Natural Resources Management

Aquaculture and Aquatic Resources Management

Aquaculture and Aquatic Resources Management (AARM), a field of study in the School of Environment, Resources and Development (SERD), promotes research and development of sustainable aquaculture and aquatic resources management practices. AARM uses innovative and integrated approaches to ensure the sustainability of aquacultural commodity chains and production systems in the tropical countries. AARM's strength lies in its ability to integrate education, research and outreach experience to develop novel and innovative approaches for aquaculture and aquatic resources development and management in Asia and beyond.

Research Themes

- Small-scale aquaculture
- Seed production and genetics
- Fish nutrition and feeding management
- Participatory approaches to inland fisheries and wetlands management
- Approaches and tools for coastal zone management
- Climate change vulnerability to aquaculture and aquatic resource base and mitigation of climate change impacts through alternative aquaculture technology
- Regional education development

Current / Recent Research

Development of release strategies for stock enhancement of tropical abalone

With funding from the International Foundation for Science (IFS) and in partnership with the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC), a series of experiments were conducted to determine the optimum release size, habitat and season for the stock enhancement of the tropical abalone, Haliotis asinina, which tends to be overharvested due to high consumer demands, resulting in the decline of natural stocks. The research findings debunked the general premise that larger abalone will have a greater chance of survival than the smaller ones. Smaller juveniles (2.5-3 cm shell length) are recommended for release in marine protected areas with dead branching corals encrusted with algae during the summer when natural food is abundant. The research findings will be useful for institutions involved in abalone stock enhancement to reduce the cost of abalone seed production in the hatchery because they do not have to grow the abalone to a bigger size before releasing them to wild habitats. Releasing abalone at the suitable season will increase their chance of survival, growth and reproduction.

Development of sustainable aquaculture systems

AARM conducts comprehensive studies gearing towards the development of responsible aquaculture and aquatic resources management practices to sustain socially and environmentally responsible finfish and shellfish production systems. Key areas of research includes improved aquaculture waste reduction and management techniques to minimize any adverse environmental impacts, pond nutrient dynamics, reduction of fishmeal use in fish feeds, integrated coastal management and aquatic product quality and certification.

Partners

- International Research Institute of Stavanger, Norway
- University of Michigan, USA
- Network of Aquaculture Centres in Asia-Pacific
- Department of Fisheries, Thailand
- OxSeaVision, Thailand
- Southeast Asian Fisheries Development Center, Aquaculture Department, Philippines
- Sagay Marine Reserve Protected Area Management Board, Philippines
- International Foundation for Science, Sweden
- University of Stirling, United Kingdom
- Royal Thai Government
- European Union

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AARM Specialization

- Aquatic Seed Production
- Aquaculture Systems and Ecology
- Animal Feed Resources Development
- Feed/Fish Processing Technology
- Aquatic Resource Management
- Seed Production
- Intensive aquaculture
- Integrated Coastal Management
- Biostatistics and Research Design
- Women in Aquaculture
- Small-scale aquaculture
- Integrated farming

Aquaculture and Aquatic Resources Management

Faculty & Research Staff	Research Interests
Dr. Wenresti Glino Gallardo *Coordinator* gallardo@ait.asia	Aquatic Seed Production Aquaculture Systems and Ecology Coastal Resources Management Marine Protected Areas Stock Enhancement
Dr. Amararatne Yakupitiyage amara@ait.asia	Animal Feed Resources Development Feed/Fish Processing Technology Fish Nutrition and Energetics Data-Base Development and Curriculum Development Research Into Education Technology
Dr. Amrit Bart bart@ait.asia	Aquatic Resource Management Cryopreservation Reproductive Physiology Seed Production
Dr. Dhirendra P. Thakur thakur@ait.asia	Intensive Aquaculture Water Quality and Nutrient Dynamics Environmental Impacts of Aquaculture Integrated Coastal Management Aquatic Product Quality and Certification
Dr. Ram C. Bhujel bhujel@ait.asia	Biostatistics and Research Design Curriculum Development Women in Aquaculture Broodstock Nutrition/Management and Fry Production Technology Transfer/Extension
Emeritus Professor Peter Edwards pedwards@ait.asia	General Aquaculture with emphasis on Recycling Organic Wastes Small-scale Aquaculture Integrated Farming Aquaculture for Poverty Alleviation Systems Approaches to Education, Research and Development Curriculum Development Project Formulation, Management and Evaluation

Computer Science and Information Management

The Computer Science and Information Management (CSIM) field of study fosters high-level research, and aims to meet the growing regional demand for persons skilled in various aspects of computing. One focus is on educating educators who can, in turn, effectively disseminate knowledge and skills to more people. The core functions include artificial intelligence, software engineering, networking and information systems. The field of study also endeavors to enhance teaching and research activities in computer architectures, object orientation, neural networks, multimedia and other rapidly-evolving areas in computer science. The research topics range from those addressing the practical problems of applications development, to those dealing with the abstract and theoretical issues of computer science and advanced computing. Researchers are also encouraged to conduct and explore areas of Computer Science which interact with Information Management, Industrial Engineering, Manufacturing Systems Engineering, Telecommunications, Mechatronics and other fields of study covered at the Institute.

Current / Recent Research

Information Management

Information Management activities are strategic responses to society's changing needs. As the first of its kind in Southeast Asia, it will continue to evolve as organizations cope with the proliferation and complexity of new information technologies and services. Information is an essential resource for academic excellence, competitiveness in business and industry, scientific progress, and national development. High-quality sources must be located, and arrangements must be made for access to timely, accurate, appropriate, and cost-effective information. Technological advances in telecommunications and the hardware and software of computing can be utilized to provide the optimum access to information. The need for information management skills in government and private organizations is increasingly recognized. People knowledgeable in methods of facilitating information collection, dissemination, and use are in demand. Such persons should also be skilled in identifying information needs and in accessing, repackaging, and presenting information in such a way that it can be utilized in support of the objectives of the users.

Industrial Robotic Bin Packaging System

One research area in AIT is on a vision-based Industrial Robotic Bin Packaging System that involves interdisciplinary skills in Robotics, Machine Vision and Image Processing. The project aims to implement a bin picking system using a Motoman 6-DOF robot. The robot is required to pick up the topmost part from a bin containing randomly piled parts and place them at the required location until there are no parts left in the bin.

Web Community and Knowledge-based Intelligent System for Supporting Customer Relationship Management for Thai SME

Small and Medium Enterprises (SME) are the root of Thai economy and play a substantial role for its success in research partnership. Since customers are the major sources of company revenue, the relationships with customers are critical for successful business processes. The main objective of this project is to develop a prototype of Collaborative Web-based environment (Web Community) and Knowledge-Based/ Expert system with CRM (Customer Relationship Management) suitable for Thai SME. It aims to improve the communication between practitioners and experts when exchanging CRM-related knowledge.

A Collaborative Intelligent Tutoring System for Medical Problem-Based Learning

This project combines concepts from ITS (Intelligent Tutoring System) with those from Computer Supported Collaborative Learning (CSCL) to develop an intelligent group-based medical PBL (Problem-based Learning) system. The project departs from previous efforts to incorporate user modeling into computer supported collaborative environments by focusing on modeling individual and group problem solving behavior. The techniques will be implemented using client/server combination and will incorporate a multi-modal interface that integrates text and graphics to provide rich communication channel between the students and the system, as well as among students in the group.

Future Research Areas

- Enhancement of the system in terms of Computational Efficiency
- Image Processing and Pattern recognition
- Software Development
- Machine Learning

Partners

- Solimac Automation Company, Thailand
- Royal Thai Government
- Thai SMEs

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CSIM Specialization

- Algorithms
- Computer Graphics
- Robotics
- Machine Vision and Learning
- Software Engineering
- Open-source Software Development
- Analysis and Design of Information Visualization Systems
- Human-Computer Interaction
- Semantic Fisheye Views
- Electronic Commerce/ Electronic Business
- Web-based Information Systems
- Data Warehousing/Data Mining
- Decision-Theoretic Problem Solving
- Modeling and Elicitation of User Preferences
- Personalization, Electronic
- Logic Programming
- Knowledge Representation and Reasoning
- Argumentation, MultiAgent Computing
- Foundations of Programming
- Computer Networks and Operating System
- Internet Technology
- Information Representation
- Semantic Web
- Digital Libraries

Computer Science and Information Management

Faculty & Research Staff	Research Interests
Dr. Paul Janecek *Coordinator* paul_janecek@ait.asia paul@cs.ait.asia	Analysis and Design of Information Visualization Systems Human-Computer Interaction Semantic Fisheye Views
Dr. Sumanta Guha guha@ait.asia	Algorithms Computer Graphics Computational Geometry Robotics
Dr. Matthew N. Dailey mdailey@ait.asia	Machine Vision and Learning Software Engineering Open-source Software Development
Dr. Vatcharaporn Esichaikul vatchara@ait.asia	Electronic Commerce/Electronic Business Web-based Information Systems Hypermedia Data Warehousing/Data Mining
Prof. Peter Haddawy haddawy@ait.asia	Decision-Theoretic Problem Solving Probabilistic Reasoning Modeling and Elicitation of User Preferences Personalization Electronic Commerce Medical Applications
Dr. Phan Minh Dung dung@cs.ait.asia	Logic Programming Knowledge Representation and Reasoning Argumentation, MultiAgent Computing Semantic Grids, Trust and Security Artificial Intelligence
Prof. Kanchana Kanchanasut kanchana@ait.asia	Foundations of Programming Computer Networks and Operating System Data Structures and Algorithms Principle Programming Languages Internet Technology
Dr. Vilas Wuwongse vw@cs.ait.asia	Information Representation: Semantic Web Digital Libraries


Computational node 1
Computational node 2
Computational node 3
Computational node 4

Construction, Engineering and Infrastructure Management

The Construction, Engineering and Infrastructure Management (CEIM) field of study focuses on technical management of projects and corporations in both operational and strategic issues. Research at CEIM aims to integrate industry needs with innovative solutions for improvement of development projects. The coverage of CEIM education and research includes property, infrastructure, oil and gas, and industrial development projects.

Research Focus

CEIM currently conducts research programs in many countries including Vietnam, Thailand, Pakistan, Lao PDR, Bhutan and Nepal. Research in construction management aims to add new and exciting ways that innovative management models can be adapted in different cultures and environment. These include construction planning and control, system dynamics modeling and simulation, information technology, automated techniques for productivity monitoring and improvement, organization structuring, human and environmental factors in sustainable construction, conflict avoidance and dispute resolution, and innovative project financing.

Infrastructure Management research deals more on the processes necessary for the planning and development of new infrastructure in a cost-effective manner, and in maintaining and operating mature infrastructure for sustainability. A wide variety of management topics are covered, such as infrastructure planning, infrastructure economics, condition assessment and procedures, infrastructure management systems, optimal maintenance management, reliability of infrastructure systems, asset valuation and utilization, and infrastructure planning under risk and uncertainty.

CEIM faculty and research teams apply the Public-Private Partnership approach for mass transit projects in Thailand. The project focuses on optimizing the strengths of government and private sectors. Legal and financial framework has been scrutinized in relation to project delivery processes. Activities include exhaustive analysis on various issues and problems such as a revenue sharing model, risk appropriation, financial modeling.

Partners

- Bovis Lend Lease
- C.H. Karnchang, Thailand
- PetroVietnam
- ASIA LINK, European Union
- Weimar University, Germany
- Tshinghua University, China
- University of Tokyo, Japan
- National Central University, Taiwan
- Chulalongkorn University, Thailand
- King Mongkut's University of Technology Thonburi, Thailand
- Ministry of Transport, Royal Thai Government
- Ministry of Education, Royal Thai Government
- Bureau of Budget, Royal Thai Government

Future Research Areas

- International construction business management
- Innovative real estate project delivery processes
- Mega Project financing
- Computer simulation of construction operations

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CEIM Specialization

- Construction simulation
- System modeling in construction
- Virtual reality application in construction
- Construction safety management
- Strategic Management in Organizations
- Project Financing
- Project Planning, Scheduling, and Controls
- Construction Disputes and Litigation
- Risk management
- Real option modeling
- Change management
- Financial management
- Infrastructure asset management
- Contract administration
- Construction claims and litigation

Construction, Engineering and Infrastructure Management

Faculty & Research Staff	Research Interests
Dr. Bonaventura H. W. Hadikusumo *Coordinator* kusumo@ait.asia	Construction Simulation System Modeling in Construction Virtual Reality Application in Construction Construction Safety Management
Dr. Chotchai Charoenngam chot@ait.asia	Strategic Management in Organizations Project Financing Project Planning, Scheduling, and Controls Construction Disputes and Litigation
Adjunct Faculty	
Dr. Santi Charoenpornpattana santicha@ait.asia	Risk Management Real Option Modeling Change Management
Dr. Poovadol Sirirangsi poovadol.sir@bbl.co.th poovadol@ait.asia	Financial Management Infrastructure Asset Management
Dr. Roland Amoussou Guenou ramoussou@ait.asia	Contract Administration Construction Claims and Litigation

Energy

The Energy program at AIT is one of most rapidly growing fields of study at the Institute. Research conducted here aims to accelerate the development and commercialization of energy-efficient technologies into the market, and to educate future generations of energy efficiency leaders. By focusing on areas involving environment and climate change, energy for sustainable development, renewable energy, electric power system management, and energy economics planning, AIT's Energy field of study continues to be one of the most competitive and advanced in the region.

Current / Recent Research

Energy Issues

Together with the ASEAN Center for Energy and some notable Norwegian institutions, AIT responds to critical energy security concerns, the escalating energy demand and increasing environmental pressures by gathering technologists, investors, entrepreneurs, policy makers and energy professionals who are defining the future of global energy through the South-South-North Networking. Recent topics included renewable energy, the ASEAN Power Grid, trends in energy and environment modeling in ASEAN.

Atmospheric Brown Cloud (ABC) Emission Inventory

ABC is a result of emissions of aerosol particles and gaseous species from a wide range of anthropogenic and natural sources, such as fossil fuel combustion and bio-fuel burning. In order to advance our scientific understanding of the cause (sources, meteorological factors. etc.) and effects of ABCs in Asia and the Pacific, and formulate suitable mitigation measures, it is crucial to have a comprehensive knowledge on the emissions of aerosol particles and precursor gaseous species from different sources and sectors with reasonably good spatial and temporal solutions.

This project is involved in the development of a manual for establishing and inventory of emissions of gasses causing ABC (atmospheric brown cloud). The project will also prepare an emission inventory of selected countries in South and/ or in South East Asia.

Bio Energy for Rural Development and Poverty Alleviation (BEN -RUD)

The primary objective under the broader theme on "bio-energy" is to carry out an initial assessment of the potential of bio-energy for rural development for all types of bio-energy i.e liquid, solid and gas.
This project aims to identify the contributions of bio-energy products to rural development and poverty alleviation. The methodology includes assessing the potentials of all types of bio energy; liquid, solid, gas through specific case studies. Barriers in bio energy production will be identified.

Driving Force of Energy Consumption and Air Pollution (DFECAP)

This project is about collecting data on driving forces of energy consumption and their energy characteristics in Thailand. It involves collection and processing of data on energy and energy consuming devices in Thailand from available publications and projections.

Future Driving Force of Global Warming (FDFGW)

The project is about collecting data related to future driving force of global warming in Thailand from available publications. The research project collects and project future estimates of households, industries and transportation in the countries.

Future Research Areas

- Wind Energy
- Smart Grid
- Energy and Climate Change
- Bio-fuel
- Renewable Energy Resources and Technologies
- Energy Efficiency and Conservation
- Energy and Sustainable Development

Partners

- Ministry of Foreign Affairs, Norway
- UNEP Regional Resource Center for Asia and the Pacific (RRC.AP)
- Global Network on Energy for Sustainable Development, Denmark
- Mizuho Information & Research Institute, Inc (MHIR), Japan

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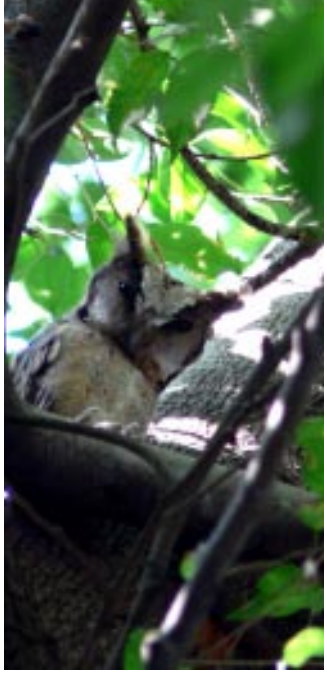
Energy Specialization

- Solar Energy (Radiation, Thermal and Photovoltaic)
- Energy and climate change
- Cleaner Production
- Energy and Environmental Policy
- Electricity Economics and Planning
- Energy
- Energy Auditing and Conservation
- Efficiency and Management in Buildings and Industries
- Demand - side Management
- Cogeneration, Energy - Economy - Environment Interactions
- Artificial Intelligence Applications to Power Systems
- Parallel Processing Applications
- Power System Operation & Control, and Power System Restructuring
- Generation Expansion Planning
- Energy Sector Development
- Environmental Mitigation

Energy

Faculty & Research Staff	Research Interests
Prof. Sivanappan Kumar *Coordinator* kumar@ait.asia	Solar Energy (Radiation, Thermal and Photovoltaic) Energy and Climate Change Cleaner Production Energy and Sustainable Development
Dr. Weerakorn Ongsakul ongsakul@ait.asia	Artificial Intelligence Applications to Power Systems Parallel Processing Applications Power System Operation & Control Power System Restructuring
Prof. Ram Manohar Shrestha ram@ait.asia	Energy and Environmental Policy Electricity Economics and Planning Energy Economic and Environmental Modeling and Environmental Pricing Implications of Privatization in Power Sector
Dr. Brahmanand Mohanty mohanty@ait.asia	Energy Auditing and Conservation Efficiency and Management in Buildings and Industries Demand-side Management Cogeneration Energy - Economy - Environment Interactions National and Regional Energy Efficiency Policies
Dr. Charles O. P. Marpaung cmarpaung@ait.asia	Generation Expansion Planning Energy Sector Development Environmental Mitigation

Environmental Engineering and Management



Research in Environmental Engineering and Management (EEM) seeks to address the region's need for providing safe and adequate water supplies and sanitation facilities. The program seeks solutions to environmental problems, water supply and sanitation, wastewater treatment and disposal systems, air pollution, solid and hazardous wastes, waste minimization, and life cycle assessment, environmental impact assessment and management and environmental toxicology. Researchers in EEM develop techniques to mitigate air, water and solid waste pollution to improve the health and well-being of the society. Activities include monitoring and managing solid waste management sites while monitoring health and ecological risks in the region. EEM also focuses on developing waste and water treatment technologies and improving better environment management tools.

Current / Recent Research

The Asian Regional Research Programme on Environmental Technology ARRPET Phase I-II

This program aims to conduct research on environmental issues relevant to Asia. The issues covered include wastewater, solid waste, air pollution and hazardous waste. ARRPET is coordinated by the Asian Institute of Technology and funded by the Swedish International Development Cooperation Agency (Sida). ARRPET II involves 20 National Research Institutes (NRIs) from 8 Asian Countries. The program thrusts include conducting strong research relevant to Asian region with a focus on hard science and technology issues, mobilizing and strengthening the competence and capacity of the NRIs participants to aide in their national initiatives for policy plans, controlling urban and
environmental pollution, and disseminating the results of the program among regional policy makers.

Research Partnerships for Sustainable Development in Southeast Asia

Following the framework of Switzerland's National Centre for Competence in Research, the AIT North-South team is conducting research on environmental sanitation. These research activities have three basic objectives:

1. Identify determinants for improving environmental sanitation services in urban and peri-urban areas, taking into account the dynamics of social systems

2. Assess the potential to reduce vulnerability and increase resilience of urban and mobile poor populations through improved environmental sanitation services

3. Test alternative methods for improving environmental sanitation planning

Partners

- University of Tokyo, Japan
- INSA of Toulouse, France
- University of Virginia, USA
- Balkh University, Afghanistan
- University of Kalmar, Sweden
- Cheng Shiu University, Taiwan
- University of Illinois at Urbana-Champaign, USA
- Shivaji University, India

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EEM Specialization

- Anaerobic and Aerobic Wastewater Treatment
- Biofilm Processes for waste water treatment
- Water Pollution Control
- Waste Recycling and Recovery
- Hazardous Wastes Treatment and Management
- Waste Minimization and Waste Auditing / Clean Technologies
- Solid-liquid Separation Technologies for Water and Wastewater Treatment
- Development of Particulate Matter
- Micronutrient Chemistry
- Heavy Metals
- Ecotoxicology
- Plant Nutrition
- Natural Systems as Wastewater Treatment Systems
- Strategic Environmental Sanitation
- Constructed Wetlands for Wastes and Wastewater Treatment

Environmental Engineering and Management

Faculty & Research Staff	Research Interests
Dr. Oleg V. Shipin *Coordinator* oshipin@ait.asia	Natural systems (ponds and wetlands) as Wastewater Treatment Systems Microbial Aspects of Environmental Engineering Environmental Impact Assessment in the Developing Countries Molecular Microbiology
Prof. Ajit Padmakar Annachhatre ajit@ait.asia	Anaerobic and Aerobic Wastewater Treatment Biofilm Processes for Waste Water Treatment Environmental Impact Assessment
Prof. Chettiyappan Visvanathan visu@ait.asia	Waste Minimization and Waste Auditing / Clean Technologies Solid -liquid Separation Technologies for Water and Wastewater Treatment Desalination and Membrane Technology Wastewater Reuse Operation and Management of Water and Wastewater Treatment Plants Industrial and Hazardous Waste Management Industrial Pollution Control and Solid Waste Management (Landfill and Methane Oxidation)
Dr. Nguyen Thi Kim Oanh kimoanh@ait.asia	Development of Particulate Matter Interactions between Air Pollution and Climate Modeling Secondary Particle Formation in Tropical Urban Areas Long-range Transport of Air Pollution Development of Integrated Management Strategies for Open Agro-residue Burning Air Pollution Meteorology
Dr. Preeda Parkpian preeda@ait.asia	Micronutrient Chemistry, Heavy Metals, Ecotoxicology, Plant Nutrition, Environmental Pollution, Nutrient Recycling and Chemistry of Toxic Metals and Toxic Organics in Soils, Sediments, and Plants
Dr. Thammarat Koottatep thamarat@ait.asia	Strategic Environmental Sanitation Constructed Wetlands for Wastes and Wastewater Treatment Management of Non-point Source Pollution Treatment of Micro-pollutants and Infectious Pathogens
Dr. Kare Helge Karstensen khkait@ait.asia	Environmental Engineering and Management

Food Engineering and Bioprocess Technology

Food Engineering and Bioprocess Technology has evolved from its orginal strong emphasis on post harvest and food process technology to new research areas which emphasize bioprocess technology that is relevant to the region and developing countries. Research carried out aims to be relevant to both industry and small-scale farmers. Emphasis is placed on the reduction of post harvest losses, value addition of the product, and the development of new methods that maintain the product's energy, sensory and nutritive value. The application of bioconversion in various sectors of industry and agriculture includes the development of systems for handling, processing and storage of both durable and perishable food products, and in developing small-scale food processing technologies. The field of study also stresses application of new methods such as high pressure de-infestation to increase shelf life, modified atmospheric packaging and alternative non-conventional processing techniques like infrared, microwave and ohmic heating.

In bioprocess technology, the focus of research is on production of liquid biofuels, rapid detection of food pathogens using molecular biology methods and some aspects of functional foods like pro- and prebiotics and natural products.

Current / Recent Research

Production of Bio-fuels

Bio-fuels are studied as a renewable source of energy. Technical and socio-economic dimensions of food security are also investigated. Research includes production of second generation bioethanol from lignocellulosic residues, and is being done in collaboration with universities in Europe (France and Sweden), South-East Asia (Vietnam, Cambodia), South Asia and with local industries in Thailand. The potential and barriers in using these methods requires life cycle analysis.

Rapid Detection of Food Pathogens and Metabolites

In order to overcome the problem of the extended period of time required for the detection of food pathogens by the traditional methods, new methods of molecular biology including the PCR, immunological techniques and others, are being developed. This work was initiated with support from the Royal Thai government.

This experience is used in the detection of bacteria and fungi in other industry like textiles.

Food Supply Chain Management

Research on redesigning the food supply chain is another research field which is of considerable interest, as research concentrates on innovative but affordable systems. The purpose of these studies is to optimize the value chain while emphasizing distinctiveness in the traceability of products using a RFID reader. This work is being done in food products which are of considerable interest to the local food industry including rice, shrimp and other aquatic products.

Improving the Quality Evaluation of Food Products

Another area of research is non-destructive evaluation, online control and objective analysis for quality of food products. Some equipment used in this study includes – ultrasound testing apparatus, electronic nose, acoustic testing, the texture profile analyzer and image processing.

Future Research Areas

- Bio-fuels
- Functional foods including probiotics and natural products
- New minimal processing methods and product quality evaluation
- Food supply chain management

Partners

- Local rice millers, Thailand
- Juice processing industries, Thailand
- Center of Biodiversity and Indigenous Knowledge, China
- Betagro, Thailand
- Charoen Pokphand Group, Thailand
- Double A, Thailand
- CIRAD French Agricultural Research Centre for International Development
- Hanoi University of Technology, Vietnam

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FEBT Specialization

- Postharvest of Cereals
- Postharvest of Fruits and Vegetable
- Food Process Engineering
- Food Bioprocess Technology
- Agro-Industry System Development
- Agriculture and Food Biotechnology
- Nanotechnology and its Applications in Food and Neutraceuticals
- Functional Properties of Proteins and Polysachharides
- Production of Useful Chemicals by Bioroutes
- Food Safety and Rapid Detection Methods
- Functional Foods and Nutraceuticals (Pre- and Probiotics)

Food Engineering and Bioprocess Technology

Faculty & Research Staff	Research Interests
Prof. Athapol Noomhorm *Coordinator* athapol@ait.asia	Postharvest of Cereals Postharvest of Fruits and Vegetable Food Process Engineering Food Bioprocess Technology Agro-Industry System Development
Dr. Anil Kumar Anal anilkumar@ait.asia	Agriculture and Food Biotechnology Nanotechnology and its Applications in Food and Neutraceuticals Functional Properties of Proteins and Polysachharides Food Colloids and Biopolymers Controlled Release and Targeted Delivery of Biomolecules
Prof. Sudip K. Rakshit rakshit@ait.asia	Second Generation Biofuels Production of Useful Chemicals by Bioroutes using By-products Food Safety including Rapid Detection of Pathogens using Molecular Biology Methods Pre- and Probiotics, Antioxidants and Antimicrobials Enzyme Production and Applications

Gender and Development Studies

Gender and Development Studies (GDS) elucidates how gender, as a social and cultural construction, shapes people's lives, their relationships, the workplace, institutional structures, public policy and the production of knowledge. Research at AIT emphasizes the importance of applying critical gender analysis in all areas of social life and its impact on areas such as law, politics, science, environment, education, art, commerce, psychology and health. Specifically, GDS focuses on analyzing linkages between society and natural and built environments, work and globalization, and institutions, policy and regional development from a gender analytical perspective. Using the principles and methods of scientific inquiry, AIT links current social concerns with local and national policies, and to the changing dynamics of the region and the world.

Current / Recent Research

Gender, Cross Border Migrant Workers and Citizenship

The project explores a number of issues concerning Burmese migrant workers in Thailand, focusing specially on their working condition and rights. The project also investigates the underlying drivers in both Thailand and Burma, which have lead to the establishment of new industries, and new workers in these border areas. This involves understanding the policies of the Thai government related to industrial decentralization, as well as those concerning citizenship and registration of foreign worker. These issues also need to be understood in the context not just of local and national policies, but also to the changing dynamics of the regional and the global economy.

Capacity Building for Gender, Poverty and Mobility Analysis of Road Transportation Development in GMS Region

The project aims to fill the gap in the capacity for gender, poverty and mobility analysis in road infrastructure development in four Greater Mekong Sub-region (GMS) countries, namely Lao PDR, Cambodia, Vietnam and Myanmar. For capacity building, the project set up an inter-disciplinary Area of Study of Gender, Transportation and Development between Gender and Development Studies and Transportation Engineering, and selected students from GMS countries to study Master and Diploma degree at AIT. Case studies with partner institutions in GMS countries are conducted on the issues on mobility, livelihood and road infrastructure development especially focusing on cross-border issues. A concluding workshop is to be held in mid-2010 to share findings within and outside the project.

Enabling Bio-innovation for Poverty Alleviation in Asia

The project is a competitive research grants awarding program that aims to stimulate and enable research on bio-innovation in Asia that addresses poverty alleviation, and to initiate and support the building of a network of researchers and scholars committed to understanding and enhancing bio-innovation towards economically progressive and socially responsible goals. This research program departs from a dominant techno-centric view of bio-innovation in Asia, which vests too much autonomy and power to the physical technology itself as the driving force of technology diffusion, ignoring the social contexts, the relevant social groups and the institutional factors that are involved and that enable (or constrain) innovation. Innovation is therefore recognized as a social process involving and interlinking individuals and groups nested and operating in various domains or components such as: the research domain (R&D, universities, and private laboratories); enterprise domain (seed firms and vaccine manufacturing); demand domain (farmer-users, urban poor residents, primary health centres); and policy domain (government agencies; international protocols; policies specific to industry and agriculture, or public health and safety).

Migration, Multi-local Livelihoods and Sustainable Development

The project seeks to enhance institutional capacity in policy-oriented research through training workshops, students and faculty exchange between 5 institutions in the EU and Asian region. The five institutions in this

project include: The Institute of Social Studies (ISS) in the Netherlands as the lead partner, the University of Brighton in the UK, Chulalongkorn University and the Asian Institute of Technology in Thailand, Andalas University in Indonesia. The ISS and the Asian Research Centre for Migration of Chulalongkorn University focus on migration as one facet of Sustainable Development, and the University of Brighton, the Asian Institute of Technology and Andalas University focus on natural resource management as the other facet, in which migration dynamics also play a role.

Democratizing Water Governance in the Mekong

The project is part of an action research and advocacy program within the Mekong Program for Environment, Water and Resilience (M-Power) whose chief aim is to improve livelihood security, human and ecosystem health in the Mekong region by focusing on improving water governance in the Mekong Region. M-Power's action research program is organized around comparative and regional studies and cross-cutting governance themes involving 22 research institutes in the region. In AIT, the action research is focused on dimensions of social justice and gender equality in urban and peri-urban water use and management contexts.

Gender, Politics and Development: Women's Participation in Decision-making in Thailand

The research aims to understand, using a conceptual framework derived from the politics of development, how women influence decision-making in political institutions, including government agencies and representative bodies. A main objective of the research is to understand how gender-friendly policies are adopted in a context of low women's representation in executive and legislative institutions. The research is based on qualitative data collection, mainly in-depth interviews with women and men in high-level positions within the government, in Parliament and civil society organizations. Data collection started in June 2009 and should continue until December 2009.

Future Research Areas

- Climate change adaptation and migration
- Social monitoring mechanisms for climate change at meso and local scales
- Gender and HIV Prevention in Southeast Asia
- Impact of the Economic Crisis on the Informal Economy

Partners

- Kartini Network for Women and Gender Studies in Asia
- Institute of Social Studies, The Hague
- Norwegian University of Science & Technology, Trondheim
- Kanita Women's Research Centre, Universiti Sains Malaysia, Penang
- School of Environment & Technology, University of Brighton, UK
- Asian Research Centre for Migration, Chulalongkorn University, Thailand
- Mekong Program on Water, Environment and Resilience (M-Power)
- University of Leeds, United Kingdom
- Graduate Program in Development Studies, The Royal University of Phnom Penh, Cambodia
- Public Work and Transportation Institute, Lao PDR
- Transport Development and Strategy Institute, Vietnam
- Economic and Development Association, Myanmar
- Women's Studies Program, University of Indonesia
- Fisheries Administration (FiA), Cambodia
- Human Rights Program, Mahidol University, Thailand
- International Development Studies (MAIDS), Chulalongkorn University, Thailand

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GDS Specialization

- Impact of economic globalization on gender relations especially focusing on women's work
- Road infrastructure development and women's mobility and livelihood
- Gender issues in aquaculture and fisheries/women's access to technology
- Gender, environment, natural resource management and climate change
- Livelihoods and migration
- Gender and political ecology
- Gender and development issues in Southeast Asia
- HIV/AIDS, the role of technologies in gender and development

Gender and Development Studies

Faculty & Research Staff	Research Interests
Dr. Philippe Doneys *Coordinator* philippe@ait.asia	Gender and development issues in Southeast Asia The role of civil society including women's groups Development and human rights organization HIV/AIDS Transnational issues such as migration and trafficking Global activism and globalization
Dr. Kyoko Kusakabe kyokok@ait.asia	Impact of economic globalization on gender relations: Women's work Road infrastructure development and women's mobility and livelihood Gender issues in aquaculture and fisheries/women's access to technology Informal economy and social security Border, market and state: Ways women in the borderlands negotiate with markets and states Gender analysis of organizations Gender mainstreaming
Dr. Bernadette P. Resurrection babette@ait.asia	Gender, environment, natural resource management and climate change Livelihoods and migration Gender and political ecology Globalization, migration and social identities Gender mainstreaming and institutions

Geotechnical and Geoenvironmental Engineering

Apart from the traditional areas of foundation engineering, earth structures, underground excavations, land subsidence, and landslide mitigations, AIT's geotechnical engineers and researchers are increasingly involved in new and dynamic areas in geosynthetic engineering, land reclamation, lightweight materials, forensic engineering and the effective recycling of waste materials. As engineers are challenged to solve environmental problems, research at AIT is always aligned with current issues such as the reduction of construction wastes, provision of efficient waste disposal facilities, clean up of contaminated sites as well as geological related hazards such as landslides and erosion.

Research Focus

Engineering and Applied Geology
Thailand, Vietnam, Lao PDR and Myanmar

- Engineering Geology
- Site Investigation And Terrain Evaluation
- Rock Mechanics
- Applied Geophysics
- Airphoto Interpretation
- Rock Slope Engineering
- Underground Excavations And Tunneling
- Analytical Geomechanics

Geoenvironmental Engineering
Thailand, Maldives, Bangladesh and Korea

- Waste Characteristics
- Sources Of Ground Contamination
- Classification Or Organic And Inorganic Compounds
- Hydrogeological Characteristics Of The Ground
- Mass Transport In Saturated And Unsaturated Media
- Contaminant Transport And Transport Modeling

Soil Engineering
Thailand, Maldives, Bangladesh and Korea

- Soft Ground Improvement And Construction Techniques
- Soil Dynamics Earthquake Engineering
- Earth Reinforcement And Earth Retaining Structures
- Pavement Design And Construction
- Risk Analyses And Probabilistic Methods
- Numerical Methods And Computer-Aided Design
- Geosynthetic Engineering; And Lightweight Materials

Geosystem Exploration and Petroleum Geoengineering
Thailand, Vietnam and Lao PDR

- Onshore Exploration Of Mineral Resources
- Near Shore Reclamation
- Offshore Constructions
- Petroleum Facility Development
- Site Investigation And Testing
- Oil Tank Foundation
- Gas Pipeline Construction

Current / Recent Research

1. Geotechnical application in hydropower development project in South East Asia

   This research focuses on the optimization on site solutions, structural designs and construction while improve technique in site exploration. Rock testing is also implemented together with Electricity Generating Authority of Thailand (EGAT).

2. Tunnelling and Underground Construction in Urban Areas

   The objective of this project is to improve know-how and application of construction method and improve capacity building. Activities also aim to develop and apply methods of soft prediction of ground movements from urban environment construction activities.

3. Soil Improvement by method of Deep Cement Mixing (DCM) and Stiffened Deep Cement Mixing (SDCM) piles

   Investigations on the behavior of deep cement mixing and stiffened deep mixing piles in vertical and lateral loading are one of the thrusts of this project. Through numerical simulations, back-analyses and experiments, AIT continues to set trends in DCM research in Thailand

5. Enhancement of prefabricated vertical drains (PVD) performance sing heat (Thermo-PVD) and vacuum (Vacuum-PVD).

AIT is also investigating the use of both vacuum and heat preloading with PVD, to confirm improved soft ground results by faster rates of consolidation in a shorter length of time to reach 90% consolidation.

Future Research Areas

- Maintenance of urban infrastructure
- Behavior and performance of high CFRD dams
- Limited life Geosynthetics consisting of natural fibers
- Rain-triggered debris flow and landslides due to climate change

Partners

- Royal Thai Government
- Electricity Generating Authority of Thailand
- Kyoto University, Japan
- Saga University, Japan
- National Taiwan Ocean University, Taiwan
- National Taiwan University, Taiwan
- Mindanao University of Science and Technology, Philippines
- Hokkaido University, Japan
- Nagaoka University of Technology, Japan
- Software House, Thailand

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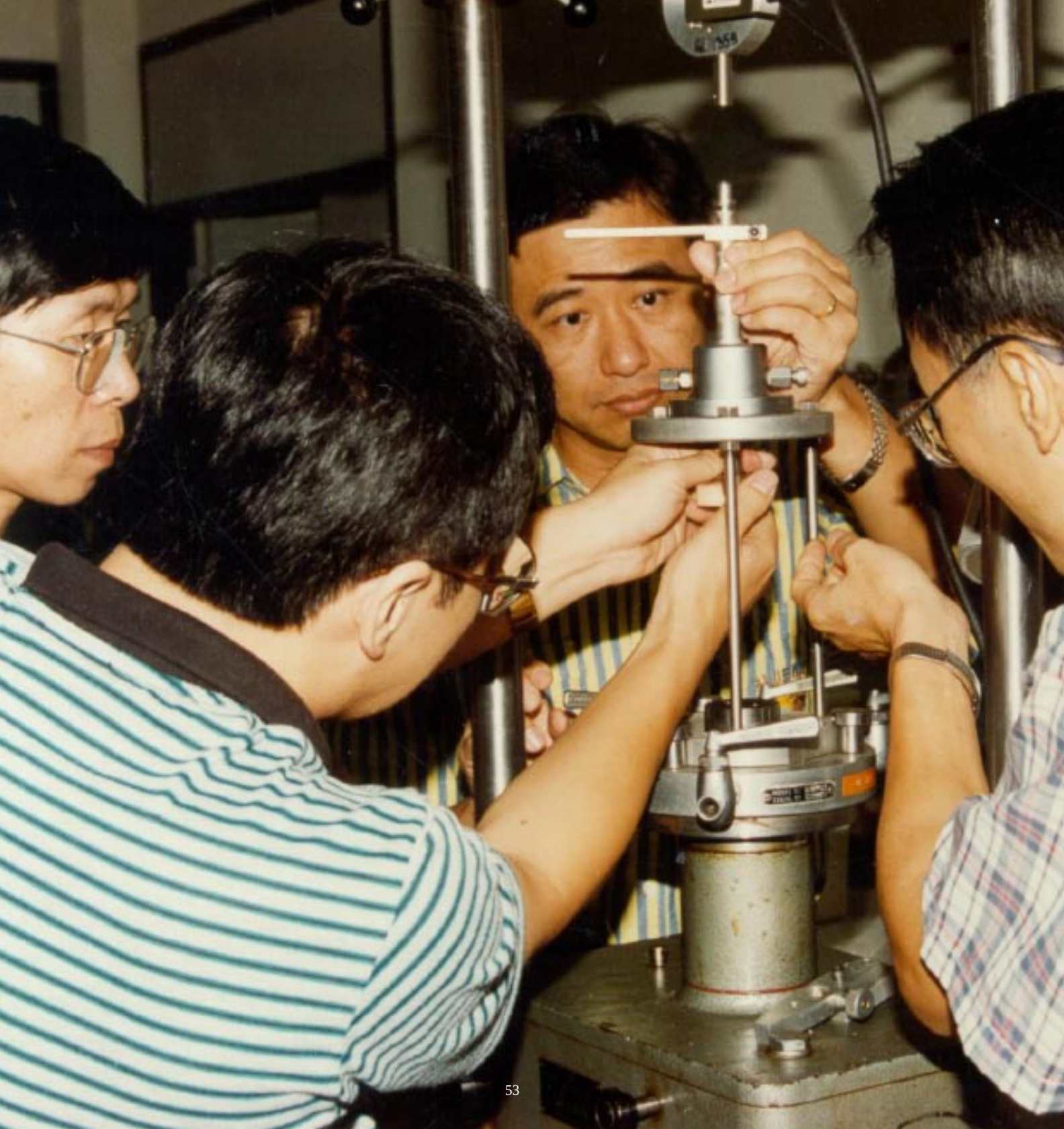
GGE Specialization

- Tunnelling and underground excavations
- Impacts of urban tunneling
- Rock engineering
- Ground improvement techniques
- In-situ testing
- Geotechnical disaster mitigation
- Probabilistic/numerical methods in Geotechnical Engineering
- Intergrated Geoengineering or Sustainable Development of Energy and Infrastructure
- Exploration of petroleum, mineral resources and groundwater
- Flow modeling in porous and fractured media
- Soil Mechanics
- Rock Mechanics
- Earthquake Engineering

Geotechnical and Geoenvironmental Engineering

Faculty & Research Staff	Research Interests
Dr. Noppadol Phien-wej *Coordinator* noppadol@ait.asia	Tunnelling and Underground Excavations Impacts of Urban Tunneling Slope Stability and Landslides Land Subsidence Rock Engineering Geotechnics in Hydropower Project Development
Prof. Dennes T. Bergado bergado@ait.asia	Ground Improvement Techniques In-situ Testing Geotechnical Disaster Mitigation Probabilistic/Numerical Methods in Geotechnical Engineering
Dr. Pham Huy Giao hgiao@ait.asia	Intergrated Geoengineering Research for a Sustainable Development of Energy and Infrastructure Exploration of Petroleum, Mineral Resources and Groundwater Flow Modeling in Porous and Fractured Media Application of Near-surface Geophysical Tools Investigation of Land Subsidence and Soft Clay in the Asian Deltas Artificial Recharge of Groundwater
Dr. Kyung-Ho Park khpark@ait.asia	Numerical Methods Analytical Methods Tunnelling Soil Mechanics Rock Mechanics Soil Dymanics Earthquake Engineering



Industrial and Manufacturing Engineering

Due to complex trends in modern-day production and service systems, the demand for organizations to excel through product, process and business development has increased. Research at AIT responds to this challenge by proposing straightforward, dynamic and future-focused engineering designs and systems that directly address society's needs for adaptable and relevant technology. Some focus areas include integrating computer controlled manufacturing systems and investigating complex interactions within industries, governments and society in general. Previous collaboration with governments include the design and production of tools for medical, disaster and relief applications such as medical tele-analyzer, automated visual inspection systems and an autonomous underwater robot for survival and rescue.

Current / Recent Research

Adaptive Layered Manufacturing

The research focuses on developing a rapid prototyping (RP) system that covers both hardware and software. Two RP techniques are being developed. The first one is a new RP technique called Selective Vacuum Manufacturing (SVM). The purpose of this development is to make RP system affordable to industry in the region. Its prototype has been constructed and we have received funding from RTG to improve it capability on making articles from natural rubber and biodegradable polylactide (PLA). We are working on improving its accuracy to extend its application to medical area. Another RP technique is double LOM that is the modification of existing LOM RP technique. It is funded by RTG and industry. Its prototype is being constructing. Other research in this area are on developing algorithms for direct transforming engineering drawing, sketch, and physical object to physical prototypes.

Development of Decision Support System for Multi-depot Vehicle Routing Problem

In many SME industries, the firms may not have sufficient money to invest in transportation resources that they forms a business alliance to pool their resources. The common resources they may share are the fleet of vehicles. This study focuses on the optimization of multiple-depot VRP with simultaneous pickup and delivery (MVRPSPD) for SMEs industries with practical considerations. The problem has the characteristics of vehicle pooling, heterogeneous fleets, multiple depots, simultaneous pickup and delivery, and time windows.

Simulation of Production Logistics for Beverage Industry

The project constructs the simulation system of production logistics for beverage industry in order to evaluate the feasibility of the production plan. The data required for such system includes two main parts, production plan data and manufacturing data. The manufacturing data will be used to identify the product characteristic and information pertaining to all of the facilities in manufacturing shop floor, while the production plan data provides information on which products and how much are to be produced. As convenient features for users, the system allows the planner to define starting date and ending date of the plan. By using the information of the production plan and the production process, the system can simulate the production process for a certain period of time which can cover more than one production plan. The system also provides the minute-by-minute simulated results of the manufacturing process so that user can monitor the production process from the simulated production plan and execute the plan more accurately based on the constraint that the user has created for a certain simulation period.

Multi-Objectives, Multi-Echelon Location Routing Problem

This research focuses on the development of a multi-objective model to locate the bagasse ethanol plant. The model is aimed to provide answers on where to open ethanol plants that will simultaneously (1) minimize total cost, (2) minimize an environment impact focus on global warming potential (GWPs) and, (3) minimize a societal risk from ethanol production and transportation.

5-axis Machining and Reverse Engineering of Fuel Nozzle for Gas turbine

A set of 6 parts of a complex gas turbine nozzle was reverse engineered. The CAD models were further used to generate the 5-axis toolpath with CATIA and MasterCAM CAD/CAM. The parts were produced on a 5-axis Integrex Mazak lathe. The project also included the inverse kinematics and postprocessing of the cutter location data generated by CATIA CAD/CAM. A training in 5-axis concepts was provided to a group of engineers of the company.

Life Cycle Assessment (LCA) of Fine Paper

The first phase of the projects consider the LCA from the tree farms to the paper mill gate. After data collection and unit process modeling for the life cycle inventory (LCI) the KCL ECO software is used to compute the environmental impact assessment. The first phase of this project is sponsored by Advanced Agro. The second phase will consider the LCA from the paper mill gate to the grave and develop and integrated LCA. The project is sponsored by Advanced Agro and the Royal Thai Government (RTG)

Small 5-axis open architecture CNC machine

A small 5 axis CNC machine was designed and the workspace was optimized in cooperation with Spar Mechatronics company. The purpose of the project was to design a 5-axis machine and teachware that can be used for training from the operator up to manufacturing engineer with reasonable cost. The 5-axis machine will be further developed to be used to manufacture prototype masters in the jewelry industry.

Future Research Areas

- Evolutionary computation methods for large scale combinatorial problems
- Decision support systems for Production Planning & Scheduling
- Sensing & Control for Manufacturing
- Rapid Prototyping
- Reverse Engineering

Partnerships

- Seagate, Thailand
- Ministry of Science and Technology, Thailand
- SCG, Thailand
- Greenspot Company Limited, Thailand
- Advanced Agro, Thailand
- Electric Generating Authority of Thailand
- Spar Mechatronics

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IME Specialization

- Multicriteria Optimization
- Lean Manufacturing
- Logistic and Supply Chain Management
- Supply Chain Modeling and Analysis
- Planning and Scheduling System
- Enterprise Resource Planning Systems
- CNC/CAD/CAM
- Five Axis Machining
- Holonic and Fractal Manufacturing
- Emergency Inventory Policies
- Inventory Policies for Perishable Products
- Supply Chain Network Design
- Rapid Prototyping
- Reverse Engineering
- Abrasive Waterjet Machining

Industrial and Manufacturing Engineering

Faculty & Research Staff	Research Interests
Prof. Voratas Kachitvichyanukul *Coordinator* voratas@ait.asia	Supply Chain Modeling and Analysis Planning and Scheduling System Enterprise Resource Planning Systems Discrete Event Simulation Software Development Manufacturing System Simulation Manufacturing Decision Support System Just-in-Time Manufacturing System
Prof. Mario T. Tabucanon mtt@ait.asia	Multicriteria Optimization Logistic and Supply Chain Management Lean Manufacturing
Ir. Erik Lucas Julien Bohez bohez@ait.asia	CNC/CAD/CAM Five Axis Machining Holonic and Fractal Manufacturing Mold and Die Design
Dr. Huynh Trung Luong luong@ait.asia	Emergency Inventory Policies Inventory Policies for Perishable Products, Supply Chain Network Design Measures of Bullwhip Effect in Supply Chains Availability-based and Reliability-based Maintenance Network Flows and Related Problems Optimization
Dr. Pisut Koomsap pisut@ait.asia	Rapid Prototyping Reverse Engineering Abrasive Waterjet Machining Sensing and Control for Manufacturing Product Design and Development

Mechatronics and Microelectronics

Today's synergy between machines and electronics has made it necessary to fuse studies on either fields. Most academic institutions and industries procure components from more developed countries, who provide technologie such as computer numerically controlled machines, robots, and automated guided vehicles. AIT's Mechatronics and Microelectronics field of study aims to be an innovator of intelligent devices, rather than being a mere system integrator. Through progressive research, the unit continues to provide new insights by integrating the study of mechanics, electronics and information technology and applying new techniques to regional needs. By promoting advanced technologies, AIT supports the growth of the economy and the development of high technology expertise.

Current / Recent Research

The Intelligent Vehicle

As one of AIT's signature research projects, The Intelligent Vehicle Project aims to manufacture unmanned transportation vehicles that are capable of accident avoidance and traffic obedience. Adaptive cruise control, distancing between two cars and locating the position of the vehicle by making use of GPS, compasses and other localized sensors are undergoing development. Future research areas include higher acceleration modes.

The Bicycle Robot

By applying sophisticated optimal control techniques, AIT produced an unmanned self-balancing two-wheeled mode of transportation, or the Bicyrobo. The Bicyrobo is capable of balancing up to 8 kg of added weight even with slight disturbances. It can also move forward and backward. Further studies on two-wheelers has also been identified and will be executed.

Future Research Areas

Systems-On-Chip integration using Customized Heterogeneous Multiprocessors (IP based approach)

With the recent advances in semiconductor industry, more than a billion transistors can be put into a single monolithic die. This allows the System-On-Chip (SOC) designers to be able to integrate more modules into their products with less cost. In this research project, a framework for combining the advantages of both was proposed: the Systems-On-Chip integration using multiprocessor with IP based approach results in fast time-to-market, and customized Heterogeneous Multiprocessors to polish the critical IP modules for high performance and low power design.

In-vehicle intelligent system for driver awareness detection

To avoid causing accidents, embedded systems using image processing technology are being developed to detect and warn drivers when he or she is drowsy or Driving Under Influence (DUI). Important factors such as the driver's condition, vehicle motion, driving speed, road conditions (slippery and winding), together with the surrounding environment, will be detected and analyzed by the system to identify risky DUI circumstances and/or drowsy driving. When applied to public transportation authorities, information collected can be reported back to headquarters.

In-vehicle intelligent system for accident detection

On-road harmful incidents such as stone-throwing attacks, hit-and-runs, are very difficult to investigate especially when victims are unconscious or have poor vision. The intelligent in-vehicle system will detect such incidents and record the scene as evidence for law enforcement authorities by using optical flow and motion field segmentation through incident detection by these video processing techniques. Necessary information will be stored for optimal power consumption and storage utilization. With the complexity of the problem, high performance embedded computing such as Graphic Processing Unit (GPU) or Field Programmable Gate Array (FPGA) will be used.

Partners

- Solimac Automation Company, Thailand
- Seagate, Thailand
- Ministry of Science and Technology, Thailand
- Embedded System Lab, National University of Singapore
- Georgia Tech Computer Aided Design Laboraatory (GTCAD Lab), Georgia Institute of Technology, USA

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MM Specialization

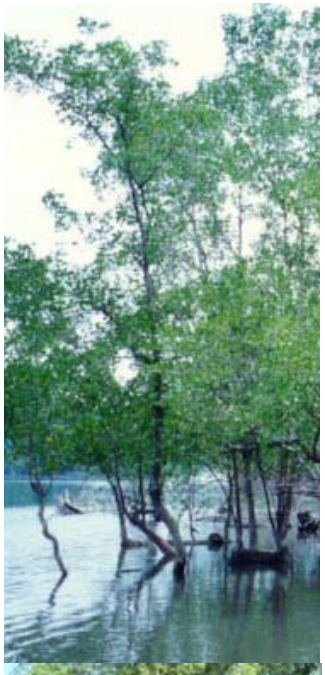
- Robotic and Automation
- Soft computing for robotics and automation
- Microelectromechanical Systems (MEMS)
- Robotics, Control, Measurement
- Design and development of hardware and software of mechatronics devices
- New robot mechanism, novel control algorithm, and innovative measurement concept
- Novel wet-chemical synthesis methods
- Directed self assembly of nanoparticles
- Bio-mimetic self organization
- Embedded Systems
- Computing, Computer Architecture
- Very Large Scale Integrated Circuit (VLSI) Physical Design

Mechatronics and Microelectronics

Faculty & Research Staff	Research Interests
Dr. Manukid Parnichkun *Coordinator* manukid@ait.asia	Robotics, Control, Measurement Design and development of hardware and software of mechatronics devices New robot mechanism, novel control algorithm and innovative measurement concept
Dr. Nitin Vasant Afzulpurkar nitin@ait.asia	Robotic and automation Soft computing for robotics and automation Microelectromechanical systems (MEMS) Computer vision
Prof. Joydeep Dutta joy@ait.asia	Novel wet-chemical synthesis methods Directed self assembly of nanoparticles (Layer by layer deposition of thin films, Colloidal thin films, Colloidal self organization (nanowires) Bio-mimetic self organization (micro-wires) Applications of nanoparticles
Dr. Mongkol Ekpanyapong mongkol@ait.asia	Embedded Systems, Hardware/Software Co-design Reconfigurable Computing Computer Architecture Very Large Scale Integrated Circuit (VLSI) Design Digital Signal Processing (DSP) Graphic Processing Unit (GPU)


AIT
Seagate
TRS
SAE
SICK

Natural Resources Management



This field of study emcompasses study on natural resources, including land, forest, water and wildlife, and environmental conservation concerns. It addresses the problems of deforestation, land and coastal ecosystem degradation, biodiversity depletion, water resource degradation, and other environmental pressures related to food security, poverty and climate variability on local, national, regional and global ecosystems. Research activities are interdisciplinary in nature involving the theory, concept and methodology from natural, social-political, economics and spatial sciences.

Current /Recent Research

Environmental Assessment

Bhutan, Nepal, Pakistan, Sri Lanka, Thailand and Vietnam

Environmental assessment focus concentrates on understanding the status of natural resources by assessing the proximate and underlying factors. Key areas include the drivers and impact of land use and land cover changes, land evaluation for sustainable soil and water management, land degradation monitoring, forest inventories and climate change impacts.

Environmental Management Systems

Nepal, Thailand, Vietnam and Indonesia

Under this theme, emphasis is given to understanding the interrelation between people and natural resources, to help plan better resource management strategies. Key areas include: water management/governance, irrigation systems, integrated land use systems, sustainable forest management systems and economic evaluation of environmental services.

Policy and Institutional Focus

Policy and institutional focus aims to understand the role and influence of policy and institutions at different levels in natural resources use and management. Key areas include: decentralization and community-based natural resources management.

Future Research Areas

- Linking natural resources management with climate change and sustainable development
- Natural resources management and food security in Asia

Partners

- Swiss National Center for Competence in Research North-South (NCCR), Berne University, Switzerland
- International Forestry and Resources Institutions (IFRI), Indiana University, USA
- Hue University of Agriculture and Forestry,Vietnam
- CIRAD *(Centre de coopÈration internationale en recherche agronomique pour le dÈveloppement)*, France
- Mekong Program on Water Environment & Resilience (M-Power), Thailand
- IWMI/ CGIAR, South Africa
- Institut de recherche pour le dÈveloppement, France
- Institut Agronomique MÈditerranÈen de Montpellier, France
- Chiang Mai University, Thailand
- Kasetsart University, Thailand
- University of the Thai Chamber of Commerce,Thailand
- United Nations Development Programme
- United Nations Environment Programme

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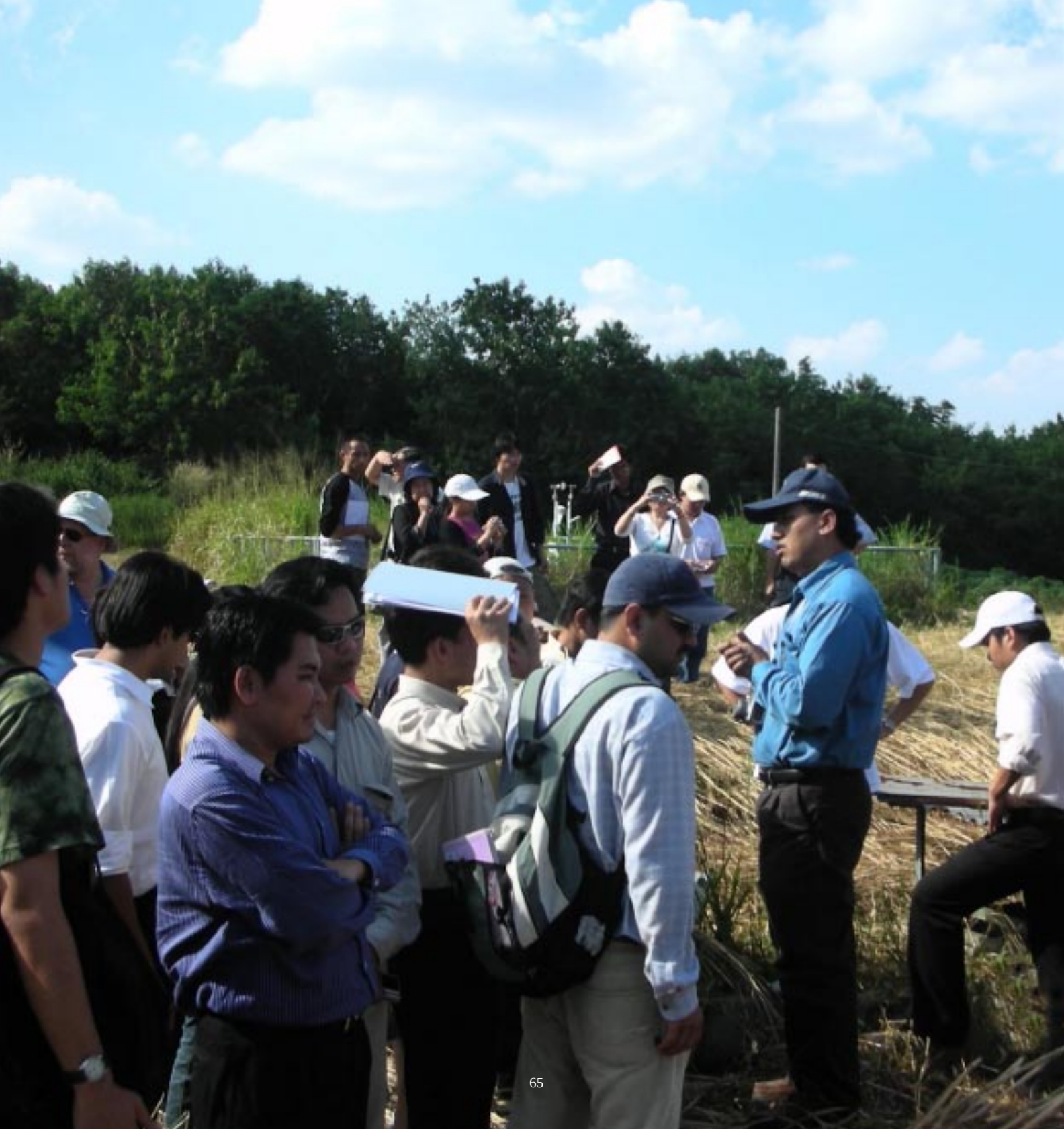
NRM Specialization

- Water Resource Management
- Water Socioeconomics and Economics
- Rural Water Uses, Production and Economics in Irrigation
- Sustainability in Rural Development
- Action-research
- Dynamic and Integrated Modeling
- Determinants and Impacts of Land Use Change
- Community-Based Natural Resources Management
- Integrated Land Use Systems
- Land Use Planning and Sustainable Land Management
- Land Use and Climate
- Natural Resources Degradation and Environmental Indicators

Natural Resources Management

Faculty & Research Staff	Research Interests
Dr. Rajendra Prasad Shrestha *Coordinator* rajendra@ait.asia	Land Use Planning and Sustainable Land Management Land Use and climate Natural Resources Degradation and Environmental indicators Poverty alleviation and livelihood GIS/RS applications and Geoinformation in Decision making
Prof. Ganesh P. Shivakoti ganesh@ait.asia	Asian Irrigation Systems Development, Land Use Change, and Forest Conservation Integrated Natural Resource Management
Dr. Roland Cochard cochard@ait.asia	Savanna Ecosystem Dynamics Landscape Ecology Invasion Biology and Bio-control of Tropical Woody Pest Plants Economic valuation of Ecosystem Services and Biodiversity Utility of Tropical Ecosystems for Disaster Risk Management
Dr. Sylvain Perret sylvain@ait.asia	Water Resource Management, Water Institutions and Governance Water Socioeconomics and Economics Rural Water Uses, Production and Economics in Irrigation Sustainability in Rural Development, Action-research Dynamic and Integrated Modeling
Dr. Dietrich Schmidt-Vogt schmidt@ait.asia	Determinants and Impacts of Land Use Change Community-Based Natural Resources Management Integrated Land Use Systems Vegetation Dynamics Secondary Forests: Ecology and Management Upland Development Environmental Degradation



Pulp and Paper Technology

Pulp and Paper Technology (PPT) strives for finding the basic solutions for the immediate technical problems facing the local and regional pulp and paper industry. Research activities in PPT are focused on optimizing pulping, bleaching and paper making processes with emphasis on the reduction of their negative impact on environment. Maintaining product quality is central to a domestic pulp and paper industry to keep a competitive edge in the global market. Continuous research on how to modify and adapt existing processes to suit local raw material is also a priority. Specific research areas include advanced paper recycling techniques, bio-refining procedures and developing the use of waste lignocelluloses materials, wild grass, and agricultural residues for production of paper, energy and medicine. PPT aims to reduce waste, preserve the forest, generate green energy and contribute in health of community.

Future Research Areas

- Packaging, Bio-refining and Specialty Paper

Partnerships

- South China University, China
- University of Washington, United States of America
- University of British Columbia, Canada

Facilities

Programmable Six-Vessel Autoclave Digester
Single Batch Digester
Bleaching Reactor
Sheet Formers
Fiber Length Analyzer FS-200
Beta Formation Tester
Deinking Flotation Cell
Spectrophotometer With ERIC Option
CRS Engineering
PFI Mill
Kajaani
Technidyne
Ambete.

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MM Specialization

- Formation or fines influence on paper properties
- Refining compared with surface treatment of fibers
- Paper making quality of frayed fibers
- Pulp and paper technology

Faculty & Research Staff

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Research Interests

Formation or fines influence on paper properties
Refining compared with surface treatment of fibers
Paper making quality of frayed fibers

Pulp and paper technology
Sustainable papermaking

Regional and Rural Development Planning

This field of study focuses on rural poverty, improvement of the quality of life, and social and economic development of rural areas. Practice-oriented rural regional planning is carried out regularly at district and sub-district levels following participatory and integrated approaches. Attention is paid to the management of development institutions, infrastructure and physical resources. Sectoral and spatial planning is equally emphasized along with the management of rural development programs and local development projects to strengthen rural communities for sustainable development.

Current / Recent Research

Sustainable Watershed Management
Bangladesh

By analyzing the factors influencing agricultural land use practices in Chittagong Hill Tracts of Bangladesh, this research revealed the influential role of several socioeconomic and spatial factors, and national policies in facilitating/constraining environmentally, economically and socially sustainable land use practices. The project employed an advanced multi-level approach when analyzing the factors influencing land use in mountain watersheds. Some prospects include the promotion of environmentally, economically and socially sustainable land uses, indispensable for ensuring sustainable conservation and development of mountain watersheds, through appropriate policy interventions.

Governance of Sanitation
Thailand

By the mandate of the Kingdom of Thailand, this project aims to understand and assess the existing environmental governance structures, their roles and mandated responsibilities as defined by law, rules and regulations both at central and local levels. Findings showed the strong link of clear policy achievements with the capacity of local governments. Activities included thorough reviews of environmental laws and plans in the national, provincial and sub-provincial levels, and in-depth interviews with key government agencies/authorities and group discussions with takeholders in local municipality areas and other environmental groups.

Partners

- Swiss National Center of Competence
- Swiss Federal Institute of Aquatic Science and Technology
- Kingdom of Thailand

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RRDP Specialization

- Watershed Management
- Natural Resources Management and Sustainable Agriculture
- Rural Regional Development Planning Methodology and Techniques
- Decentralized Planning
- Evaluation and Impact Study of Rural Development Programs
- Decentralization, Capacity and Institutional Building
- Local Governance and Community Participation and Local-level Planning
- Economic Geography
- Regional and Rural Development Planning
- Community Development

Regional and Rural Development Planning

Faculty & Research Staff	Research Interests
Prof. Gopal Bahadur Thapa *Coordinator* gopal@ait.asia	Watershed Management Natural Resources Management and Sustainable Agriculture
Prof. Jayant Kumar Routray routray@ait.asia	Rural Regional Development Planning Methodology and Techniques Decentralized Planning Evaluation and Impact Study of Rural Development Programs Rural Urban Relations Geographic Information Systems Environmental Planning and Social Impact Assessment Market Centers and Rural Development and Rural Transport Development and Community Forestry
Dr. Soparth Pongquan soparth@ait.asia	Decentralization, Capacity and Institutional Building Local Governance and Community Participation Local-level Planning
Dr. Mokbul Morshed Ahmad morshed@ait.asia	Economic Geography Regional and Rural Development Planning Community Development Civil Society and Globalization

Remote Sensing and Geographic Information Systems

Complex technology and the increasing dependence on intelligent machines require a strong grasp on the management of sophisticated data. AIT's Remote Sensing and Geographic Information System (RS&GIS) field of study specializes in developing means to understand the vast and varying knowledge that is available for the study of earth-energy interactions, food security, environmental management, medical technology and disaster mitigation. One ongoing regional responsibility is to integrate spatial data from different satellite sources in order to plan and forecast trends in agriculture, aquaculture, forestry and in turn sustainable development.

Current / Recent Research

Natural Resources Management
Thailand, India, Lao PDR, Cambodia and Vietnam

Ground water, surface and marine water quality research work has been carried out. Afforestaion and suitability study has been conducted for some locations in China, Thailand, Lao PDR, Vietnam and Cambodia. Crop substitution modeling has been done for rubber and palm plantations in Southern Thailand.

Healthcare and Business Logistics
Thailand, India, Italy and Malaysia

Ambulances, mobile hospitals are based on vehicle tracking facilitated by GIS and GPS techniques. Hospital, patient record and trauma assistance systems are linked to internet GIS based systems and provide real-time information for better healthcare. GIS is also being used for find disease risk areas and control epidemics. Business Logistics and Supply Chain management now-a-days heavily use geoinformation technology. AIT has completed a projects on business logistics and supply chain using Internet GIS, RFID (Radio Frequency Identification) and vehicle tracking.

Space Technology Applications
Japan, Thailand, India, Lao PDR, Cambodia and Vietnam

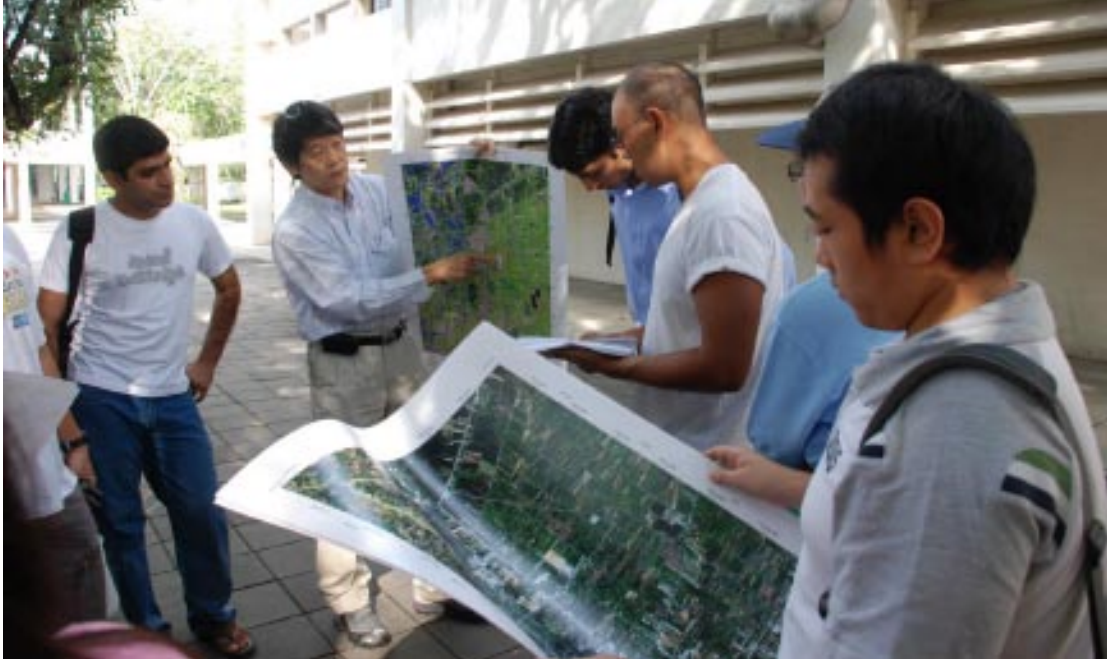
Sensor web technologies are being used for agricultural application. Satellite data from MODIS are being used for Forest mapping and Forest Fire. many innovative applications such as coastal zone management, coral and mangrove mapping and shrimp farm planning and management has been done. Natural disaster monitoring and mitigation is one of the important applications using high resolution and microwave satellites.

The RS&GIS field of study provides excellent facilities for teaching, research and projects, which consists of the Digital Image Processing laboratory, Institute-wide GIS laboratory, Asia e-learning project experiment room, and the Geoinformatics Center laboratory. Other facilities include equipment such as the ARC GIS 9.3 GIS, ERDAS Imagine, ENVI Image Processing, RFID Reader, Writer, Server, Laser Distance Finder, Pathfinder GPS, GPS Navigator and Multiband Radiometer.

The RS&GIS LAN Network can also be monitored in real time. It has an archive of over 600 scenes of satellite imagery of SPOT, Landsat-TM, NOAA, ADEOS, ERSSAR, and JERS-SAR to serve the students in their research and thesis studies. Other data, such as topographic, soil, geology maps of Thailand and some aerial photo-graphs, are also available. The RS&GIS library provides students with specialized books, journals, and computer manuals. Some equipment in its laboratory available for academic activities includes the Trimble geoexplorer and Garmin GPS Series III and V.

Partnerships

- Japan Aerospace Exploration Agency
- Japan International Cooperation Agency
- Chulalongkorn University, Thailand
- Khon Kaen University, Thailand
- Caracad Company Ltd, Thailand
- Marine Products Export Development Authority (MPEDA), India
- Wetlands Alliance Project, GMS
- Ministry of Agriculture and Forestry, Lao PDR
- Geoinformatics and Space Technology Development Agency (GISTDA), Thailand
- Universti Putra Malaysia, Malaysia
- ISMB Italy
- Osaka City University
- University of Tokyo



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RS & GIS Specialization

- HealthGIS, Environmental pollution using RS
- Satellite bathymetric mapping
- Digital photogrammetry and DTM
- Erosion Control Engineering Application
- Developing Sediment and Flood Discharge Model
- 3D Photogrammetry Image Processing
- Mapping Technology
- Digital Photogrammetry
- Computational geometry and algorithms
- GIS Development
- GIS and Remote Sensing for Epidemiology
- Aerospace System Engineering
- Space System Engineering
- Dynamic Buckling of Cylindrical Shells
- Deployable and Retractable Space Large Structure
- Space Suits and Life support System Technologies

Remote Sensing and Geographic Information Systems

Faculty & Research Staff	Research Interests
Dr. Nitin Kumar Tripathi *Coordinator* nitinkt@ait.asia	HealthGIS, Environmental pollution using RS Applications in natural Disaster Internet GIS Satellite bathymetric mapping Digital photogrammetry and DTM Soil properties investigations
Dr. Kiyoshi Honda honda@ait.asia	Erosion Control Engineering Application Developing Sediment and Flood Discharge Model 3D Photogrammetry Image Processing Terrain Modeling and Forestry
Dr. Masahiko Nagai ma-nagai@basic-hq.co.jp	Mapping Technology Digital Photogrammetry
Dr. Marc Souris souris@ird.fr	Computational geometry and algorithms GIS development Spatial analysis GIS and Remote Sensing for Epidemiology
Prof. Michiro Kusanagi kusanagi@ait.asia	Aerospace System Engineering Space System Engineering

School of Management

As the world undergoes revolutionary changes on the social, economic, political and technological fronts, various programmes AIT's School of Management offer unique competitive advantages to managers and enterprises by sharing expertise in international business and management of technology. Corporate Relations and Executive Development Services (CREDS) functions as the research, consultancy, and executive development arm of the School. CREDS links the business community, public sector and SOM through executive education programmes, executive forums, workshops, seminars, and conferences and consulting in the areas of Management of Technology, International Business, Service Marketing and Technology, and International Public Management.

Current / Recent Research

Management of Innovation & Entrepreneurship

Management of Innovation & Entrepreneurship is one area of focus covering R&D management, innovation development to organizational processes in innovation creation process. Some of the currently researched topics in this area include high tech entrepreneurship and business development, the balance of local adaptation and international standardization, new product development responding to opportunities/ new markets created by community driven regulation or environmental reputation, adoption and impact of ICT in service industries and the role of woman entrepreneurs.

Social and Environmental Responsive Management

Social and Environmental Responsive Management tackles problems emerging from climate change and aims to determine innovative ways to alleviate poverty. New ways of dealing with these challenges are explored, such as development of new business models for mitigating climate change, or new industrial production systems responding to the demands created by climate change. Energy management, sustainable tourism and controlling investment in sustainable development are research focuses.

Public Services and Policy

SOM is well known for extensive research in public policy. SOM research addresses not only government-owned organizations, but also industries, which are heavily regulated, or policy-based, and privately operated companies in the education sector, health care, telecom and financial markets. Liberalization and globalization often provide opportunities for newly industrialized countries to gain international competitive advantage. AIT research touches on managerial organization, quality issues and policies. Also subsumed under this theme is research in financial markets.

Operations and Global Supply Chain Managementt

This research focus reflects on the current trend to outsource supply chain activities to places where a cost and technology advantage can be achieved. AIT in corporates the specialization model to analyze manufacturing and distribution networks composed of multiple, individual supply chains specific to products, suppliers and customers who work together to design, manufacture, distribute, market, sell and service a product. The analysis relates to "value of information" to cope-up with distortion of demand information in the supply chain would result into new architectures of supply chains. A new research frontier is coined as Supply Chain Management 2.0. New forms of mass collaboration and the combination of the processes, methodologies, tools and delivery options to guide companies to their results more quickly as the complexity and speed of the supply chain increases due to constant price fluctuations, oil prices, shortening of product life-cycles, retail management, off-shoring and talent scarcity.

Partners

ASIA:

- Asian Institute of Management (AIM), Manila, Phillippines
- Indian Institute of Management (IIM) Ahmedabad/ Bangalore/ Kolkatta, India
- K J Somaiya Institute of Management Studies and Research (SIMSR), Mumbai, India
- Management Development Institute (MDI) Gurgoan, India
- XLRI School of Business and Human Resources, India
- KAIST Business School, Daejeon, Korea
- Seoul National University (SNU), Korea
- Guanghua School of Management (GSM), Peking University, China
- Lingnan (University) College, Sun Yat-Sen University, Guangzhou, China
- Tsinghua University, China
- Nanyang Business School, NTU, Singapore
- National Taiwan University, Taiwan

EUROPE:

- Copenhagen Business School (CBS), Denmark
- Helsinki University of Technology (TKK), Finland
- School of Business (SUSB), Stockholm University, Sweden
- European Business School (EBS), Germany
- HHL Leipzig Graduate School of Management, Germany
- Technology University of Munich (TUM), Germany
- ESCP Europe, Paris, France
- CERAM Business School, Sophia Antipolis, France
- TELECOM and Management SudParis (former INT Management), Evry, France
- EDHEC Business School, Lille and Nice, France
- EADA, Barcelona, Spain

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SOM Specialization

- Knowledge Management
- International Competitiveness of Industries and Firms
- Managerial Economics
- Project Management in Asia: theory and practice
- Supply Chain Management
- Strategic Human Resource Management
- Innovation & New Product Development
- International Marketing & Branding
- Knowledge Enabled Customer Relationship Management
- Cross-Cultural Management
- Telecommunications Technology
- Education economics
- Emerging Markets' Integration
- Business Communication
- Corporate Governance and Disclosure practices
- Shareholder Value Management

School of Management

Faculty & Research Staff	Research Interests
Dr. Barbara Igel *Dean* igel@ait.asia	Knowledge Management Management of Innovation High-tech Business Start-up and Science and Technology Parks
Prof. Lalit M Johri lmjohri@ait.asia	International Competitiveness of Industries and Firms Entry and Expansion strategies for Asian Markets Launching and Managing East West Joint Ventures and Alliances Management of subsidiaries and International Supply Chain Role of CEO in 21st Century
Prof. John C. S. Tang tang@ait.asia	Managerial Economics International Economics and Economic Appraisal of Projects
Dr. Do Ba Ba Khang khang@ait.asia	Project Management in Asia: theory and practice Monitoring and evaluating not-for-profit development projects Service quality and service productivity: modeling and applications Small and medium enterprises in ASEAN countries
Dr. Ravi Shankar ravi@ait.asia	Supply Chain Management, Operations Management Quantitative Methods for Managerial Decisions Strategic Technology Management Knowledge Management Telecom Systems Management, e-Governance Customer Relationship Management (CRM) Rural infrastructure management
Dr. Sununta Siengthai s.siengthai@it.asia	Strategic Human Resource Management The New Economy, eWork and Employment Practices HRM and Organizational Learning for Productivity Improvement Globalization of Firms in Asia, International HRM HRM and Knowledge Transfer in MNCs Career Management and Organizational Performance Labor Relations Productivity and Enterprise Competitiveness Developing and Nurturing HRD Systems in the K- Economy HRM in the ICTs Environment Performance Management in Public and Private Sectors Leadership and Organizational Culture
Dr. Yuosre F. Badir badir@ait.asia	Innovation & New Product Development Technology Management Networks and Strategic Alliances Organization Theory and Design Hybrid Innovation Management

Dr. Rian Beise-Zee beise@ait.asia	International Marketing & Branding, Health care Marketing and Customer-manufacturer interaction in innovation development
Prof. Nazrul Islam nazrul@ait.asia	Knowledge Enabled Customer Relationship Management International Technology Transfer and Negotition Technology Assessment, Forecasting and Benchmarking Strategic Management of Technology
Dr. Mark Neal markneal@ait.asia	Cross-Cultural Management Managing International Business Organization Behaviour and Development Qualitative Research Methods
Dr. Donyaprueth Krairit donya@ait.asia	Telecommunications Technology Management and Public Policy/regulations Management of Telecommunications Technologies E-Government; E- and M- Business and Commerce IT for poverty reduction IT system implementation and development Education and IT
Dr. Winai Wongsurawat winai@ait.asia	Education economics Criminology Environmental regulation Mutual fund fees
Dr. Arun Kumar Gopalaswamy arunkumar@ait.asia	Emerging Markets' Integration Market Microstructure in Emerging Markets Corporate Valuation Anti takeover defenses in M & A Joint Ventures and Strategic Alliances in Emerging Economies
Dr. Nicholas J. Dimmitt nick@ait.asia	Business Communication Corporate Social Responsibility Business Ethics Language Policy and Language Planning and Professional Development and Training
Dr. Sundar Venkatesh svenkat@ait.asia	Corporate Governance and Disclosure practices Financial Restructuring of firms in distress and the use of financial information in management control
Prof. I. M. Pandey impandey@ait.asia	Shareholder Value Management Corporate Governance and Performance in Emerging Markets Emerging Capital Market and Entrepreneurial and Venture Finance

Structural Engineering

Structural Engineering (STE) combines real technical skills with artistic flair to plan, design, and construct various structures such as buildings, bridges, sport stadiums, towers, and underground structures. Since STE has an enormous impact on everyday life, AIT responds by keeping abreast of the latest methods of structural analysis and design, new developments in sustainable construction material technology, and improved knowledge in structural loadings. AIT research is always at the forefront of advanced innovation and is relevant to regional needs and responds creatively to the industrial requirements of infrastructure development.

Research Specializations

Structural Analysis, Mechanics and Computation

Study and research areas in Structural Analysis, Mechanics and Computation include the analysis of complex and nonlinear structures, finite element methods, computational and applied mechanics, structural dynamics and vibration control, wind effects on structures, earthquake engineering, computer-aided design and expert systems.

Structural Design and Materials

Research topics in Structural Design and Materials include advanced and low-cost construction materials, analytical and experimental methods for concrete technology, reinforced and pre-stressed concrete structures, and steel structures, earthquake and wind-resistant design of structures, building and bridge engineering, fire protection technology.

Current Research

Digital and Mobile Communications

1 Enhancement of Finite Element analysis method using Kriging Interpolation.

2 Structural Health Monitoring of highway bridges.

3 Wind effects on tall buildings and flexible structures & wind tunnel model tests.

4 Vibration control of steel stacks by using dynamic dampers.

5 Seismic evaluation and retrofitting of existing buildings and structures.

6 Development of new seismic design standard for buildings and structures

7 Development of precast concrete frame buildings that are highly seismic resistant.

8 Safety evaluation of old, deteriorated concrete apartment buildings.

9 Research on optimal mix design of roller compacted concrete for dam construction.

Partners

University of Tokyo: Regional Network Office for Urban Safety (RNUS)
RNUS is a collaborative centre jointly operated by STE and the International Center for Urban Safety Engineering (ICUS), Institute of Industrial Science, the University of Tokyo for the promotion of urban safety engineering utilizing advanced engineering technologies including remote sensing and GIS

Thammasart University (TU): Boundary Layer Wind Tunnel Laboratory
This wind tunnel laboratory is a state-of-the-art research facility for the study of wind loads and several complex wind-induced effects on buildings and structures. The laboratory was developed by a joint effort between Faculty of Engineering at Thammasat University and STE of AIT. The laboratory, located in Thammasat, is the longest and largest wind tunnel in Thailand. It is capable of simulating atmospheric boundary layer wind as well as smooth and uniform wind in its 2.5m x 2.5m tunnel section with wind speeds varying from 0.5 m/s to 20 m/s. The wind tunnel is well equipped with hot-wire anemometers, pressure transducers with rotary scanning system, multi-component dynamic force \sensors, dynamic motion sensors, turn tables, rotary side frames, and several other instruments. With this facility, various types of advanced experimental research study, student training, and industrial aerodynamic tests can be realized. The construction of the wind tunnel was completed in 2003, and it has been used intensively since then by master students of AIT and Thammasat.

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STE Specialization

- Solid mechanics
- Computational Mechanics
- Bridge Engineering
- Nanomechanics
- Earthquake Engineering
- Wind Effects of Structures
- Wind Tunnel Model Tests
- Concrete Technology
- Advanced Concrete Technology
- Mechanics of Materials
- Cracking Resistance of Expansive Concrete
- Chemically Prestressed Concrete
- Inspection on Concrete Structures & Performance Based Design
- Bridge Engineering
- Structural Analysis and Design
- Computer Applications in Structural Engineering
- Tall Buildings
- Software Development
- Fluid-Structure Interaction
- Parallel Computing
- Software Development
- Low cost housing materials
- Supplementary cementitious materials
- Experimental behavior of structural systems
- Field testing of structures

Structural Engineering

Faculty & Research Staff	Research Interests
Dr. Pennung Warnitchai *Coordinator* pennung@ait.asia	Structural Dynamics Earthquake Engineering Wind Effects of Structures Bridge Engineering Control of Structural Vibration Nonlinear Oscillations Seismic Risk Analysis Seismic Resistant Design of Buildings and Structures Wind Tunnel Model Tests Experimental Techniques in Structural Dynamics
Dr. Pisidhi Karasudhi (Emeritus Professor)	Solid mechanics
Dr. Worsak Kanok-Nukulchai worsak@ait.asia	Computational Mechanics Finite Element Methods Tall Building Static and Seismic Analysis Bridge Engineering Microcomputer Software for Structural Engineering Genetic Algorithms Nonlinear Analysis of Structures and Continua Plate/Shell Structures Engineering Education Nanomechanics.
Dr. Thanakorn Pheeraphan thanakorn@ait.asia	Concrete Technology Structural Analysis Engineering Materials Composite Materials Advanced Concrete Technology Mechanics of Materials Forensic Engineering
Dr. Raktipong Sahamitmongkol sahamit@ait.asia	Cracking Resistance of Expansive Concrete Chemically Prestressed Concrete Inspection on Concrete Structures & Performance Based Design Non-Destructive Testings for Concrete Structures Tension Stiffening Effect and Bonding Characteristic of Reinforced Concrete
Dr. Songkiat Matupayont songkiat@ait.asia	Bridge Engineering Structural Analysis and Design Prestressed Concrete

Faculty & Research Staff	Research Interests
Dr. Naveed Anwar nanwar@ait.asia	Structural Analysis and Design Computational Mechanics Computer Applications in Structural Engineering Bridge Engineering Tall Buildings Software Development
Dr. Bui Thanh Tam	Computational Mechanics Finite Element Analysis Structural Analysis Fluid-Structure Interaction Parallel Computing Software Development
Dr. Sun Sayamipuk sunsaya@ait.asia	Low cost housing materials Construction materials and its durability Supplementary cementitious materials Experimental behavior of structural systems Field testing of structures

Telecommunications

Research at AIT's Telecommunications field of study plays a key role in promoting and strengthening the potential of emerging regional manufacturing industries. It involves cutting edge research on mobile communications, coherent optical communications, congestion control, ATM, and B-ISDN network, error correction and detection methods, mobile and internet traffic studies, and cabled networks, network performance analysis, planning and design.

Current / Recent Research

Digital and Mobile Communications

One focus area is to optimize the performance of advanced communication systems such as 4G. Current research involve Cognitive Radio for spectrum sharing in 4G networks and the analysis of relay networks and application of OFDMA. These are investigated using a combined layer approach.

Optical Networks & Planning

In planning infrastructure networks to support telecom services with resource efficiency and service reliability, AIT research contributes by performing refined analysis on systematic planning process, quantitative performance evaluation, statistical analysis of traffic and optimization of network resource deployment.

Quality of Service (QoS) in networks

This research aims to evaluate and devise algorithms to deploy mobile ad hoc networks. Measurement of the network is tested using actual devices and test-bed. Efficient QoS provisions in wireless networks such as broadband wireless network or mobile ad hoc networks are also being explored.

Future Research Areas

- Cognitive Radio: Detection/Estimation Techniques & Resource Allocation
- Cooperative Communication
- Network Performance Analysis, Planning and Design
- Optical, IP, Mobile Ad Hoc Networks
- Satellite Communications and Radar Problems
- Subjects on ICT applications (e-services such as e-learning, e-health, e-governance, rural development, knowledge creation and knowledge dissemination)
- Subjects on the information techniques (operating systems, programming languages, information storage and retrieval)

Partners

- TELECOM SudParis, France: Dual degree program (1st year at AIT, 2nd year at TELECOM SudParis), supported by TELECOM SudParis scholarships
- Tohuku University, Japan: Student exchange, research collaborations
- CWC, University of Oulu, Finland: Dual degree program (master, doctoral) supported by Oulu scholarships
- HUT, Finland
- Nokia, Symbian Development Training Center: Training activities approved by Nokia and organized on AIT campus
- NII, Japan: Student exchange, Research collaborations

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Telecommunications Specialization

- CDMA Techniques
- Propagation and Channel Modeling in Mobile Communications
- Satellite Communications and Radar Problems
- Digital and Mobile Communications
- Cooperative Diversity, Relay Systems
- OFDMA Resource Allocation
- High Speed Network Protocol
- IP Network
- Quality of Service based Routing Protocol
- Traffic Measurements, modeling, and performance in various networks
- Resource allocation for different services
- Network dimensioning and optimization
- Communication Theory
- Optical Networks
- Network Planning and resource allocation

Telecommunications

Faculty & Research Staff	Research Interests
Dr. R. M. A. P. Rajatheva *Coordinator* rajath@ait.asia	Digital and Mobile Communications Cooperative Diversity, Relay Systems OFDMA Resource Allocation Cognitive Radio: Detection/Estimation Techniques Space Time Processing-MIMO Systems Distributed Video Coding (DVC)
Prof. Kazi Mohiuddin Ahmed kahmed@ait.asia	CDMA Techniques Propagation and Channel Modeling in Mobile Communications Satellite Communications and Radar Problems Frequency Spectrum Management Antenna Array Processing Tropospheric and Ionospheric Propagation Studies for Microwave VHF-UHF Communications
Dr. Teerapat Sanguankotchakorn teerapat@ait.asia	High Speed Network Protocol IP Network Quality of Service based Routing Protocol Mobile Ad Hoc Network Digital Signal Processing
Mr. Tapio Juhani Erke erke@ait.asia	Traffic Measurements, Modeling, and Performance in Various Networks Resource Allocation for Different Services Network Dimensioning and Optimization
Dr. Poompat Saengudomlert poompats@ait.asia	Communication Theory Optical Networks Network Planning and Resource Allocation


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Transportation Engineering

Concerns over congestion on highways, increasing pollution and hazardous materials highlight the need to effectively maximize transportation systems. At AIT, research work is focused on alleviating transportation problems through advanced studies in transportation planning and economics, traffic engineering and safety, and the design of highways/pavements and other transportation facilities.

Current / Recent Research

Thailand Accident Research Center (TARC)

AIT has been supported by the government and business organizations to establish the Thailand Accident Research Center (TARC) in 2003. The mission of TARC involves conducting of study and research on road safety to increase knowledge and to find innovative and pragmatic solutions to minimize road accidents and improve road safety in general through high standard research and application.

Knowledge Dissemination to Improve Road Safety for Rural Communities

This project is to improve safety on minor rural roads by disseminating relevant knowledge of road safety in several aspects to local communities, to encourage public participation in improving road safety for communities, and to establish a tripartite (public-private-NGO) partnership in dealing with road accident problems in rural Thailand.

Improving Road Traffic Safety in Thailand: A Common Challenge for European and Thai Universities

The partnership between European Universities and AIT is developed to collaborate in the development of sustainable guidelines for the design of roundabouts and signalized intersections adapted to the Thai situation. Once the project completes, the proved and tested methodology can be used by the expanded EU-Asia network and others in order to prepare and implement further much needed design guidelines in Thailand.

Future Research Areas

- Improvement of Roadside Design to Reduce Number of Roadside Hazards Accidents
- Maximizing Pavement Surface Friction for Road Safety Improvement
- An Agent-Based Dynamic Simulation Model for Tour Area Evaluation

Partners

- Department of Highway, Thailand
- Thai Health Promotion Foundation
- National Health Foundation
- Department of Rural Roads, Thailand
- Toyota Motor Thailand Corporation, Thailand
- Bauhaus University, Weimar, Germany
- Szechenyi Istvan University, Hungary
- Thammasat University, Thailand
- Prince of Songkla University, Thailand
- Suraneree University, Thailand
- Royal Thai Government
- Thai Accident Resource Center

Contact

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TE Specialization

- Pavement Analysis and Design
- Highway Materials and Construction
- Asphalt Rheology and Failure Testing
- Pavement Management System
- Transportation planning
- Dynamic traffic assignment
- Dynamic OD estimation
- Activity-based travel demand analysis
- Network design problem
- Modeling public transport
- Urban Traffic Management, Control and Operation
- Transportation Demand Management
- Analysis of Intelligent Transport Systems

Transportation Engineering

Faculty & Research Staff	Research Interests
Dr. Kunnawee Kanitpong *Coordinator* kanitpon@ait.asia	Pavement Analysis and Design Highway Materials and Construction Asphalt Rheology and Failure Testing Asphalt Concrete Mixture Design and Analysis Pavement Management System Highway Safety and Accident Analysis
Dr. Hyunmyung Kim hyunmyung@ait.asia	Transportation Planning Dynamic Traffic Assignment Dynamic OD Estimation Activity-based Travel Demand Analysis Network Design Problem Dynamic, Stochastic Route Choice Problem Modeling Public Transport Intelligent Transportation System (ITS) Evaluation Transportation Network Analysis
Dr. Shinji Tanaka stanaka@ait.asia	Urban Traffic Management, Control and Operation Transportation Demand Management Human Traffic Behavior Analysis Intelligent Transport Systems

Urban Environmental Management

The Urban Environmental Management (UEM) field of study responds to the need to examine urban environmental planning and housing problems from the environment and planning perspective to promote sustainable urban development. UEM develops the capabilities and skills to confront deteriorating environmental and housing problems in urban areas in developing countries which threaten urban productivity, the quality of life of urban residents and social cohesion of urban communities.

UEM draws on and integrates theories and practices from the established disciplines of urban planning, environmental planning, urban housing, public policy and urban management into a distinctive framework of problems, issues and questions concerning the environment in cities of developing countries. UEM deals with social and environmental problems such as poor urban housing, poor water supply and sanitation, inadequate solid waste and wastewater management, land use conflicts and deteriorating environmental quality at home, workplace, neighborhood and city.

Current / Recent Research

South East Asia Urban Environmental Management (SEA-UEMA) Project

These projects sponsored some research that embrace three areas in solid waste, water supply and wastewater, and air quality and also gender equality issues in selected South East Asian Cities. The research were conducted in cooperation with universities or research agencies in respective cities.

Bio-innovation for poverty alleviation

Urban poverty takes different facets and this adds to the complexity in addressing the issue. This research addresses poverty alleviation in urban areas through innovative biotechnology.

Evaluation of Thailand Institute of Packaging for Sustainable Environment (TIPMSE) Programs as a Tool to Support Decision Making for Promoting Waste Recycling System in Thailand

One of the SWM responses is waste recycling. This research focused on encouraging participation of communities such as setting a school garbage bank, community garbage bank, and recycling centre at the municipal level.

A Review of Current Practices of integrating Social and Environmental Considerations in Urban Infrastructure Development Policies in the Asia-Pacific Region

This research investigated the current policies of infrastructure development in selected Asia-Pacific countries and examined the integration of social and environmental considerations.

Construction Waste Characterization and Management Options with a Focus on Concrete Utilization in Bangkok Metropolitan Region

Concrete debris resulting from the building demolition has a specific character. This research attempted to utilize concrete waste in BMA.

SIDA-AIT Urban Research Cooperation

This research developed a concept on establishing the network of universities and research institutes in selected Asian countries. The research also attempted to propose a place-based research by developing urban laboratory towards resilient cities.

Future Research Areas

- Adaptation of urban areas in addressing disaster risks and climate change effects
- Urban development and management information systems
- Eco-sensitive planning and low impact development in urban areas
- Policies and measures in addressing the increase of urban ecological footprint, low carbon cities and societies.
- Development of tools for assessing urban systems

Partners

A. International Organizations:

- United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)
- UN-Habitat
- United Nations Development Programme (UNDP)
- Asian Development Bank (ADB)
- Canadian International Development Agency (CIDA)
- Swedish International Development Cooperation Agency (SIDA)

B. Universities:

- Helsinki University of Technology, Finland
- University of Toronto, Canada
- Toyo University, Japan
- Ritsumeikan University, Japan
- Royal University of Phnom Penh, Cambodia
- Gadjah Mada University, Yogyakarta, Indonesia
- Bandung Institute of Technology, Indonesia
- University of Suphanawong, Lao PDR
- Ateneo de Manila University, Philippines
- De La Salle University, Philippines
- Chiang Mai University, Thailand
- Mae Fa Luang University, Thailand
- Thammasat University, Thailand
- Ho Chi Minh University of Technology, Vietnam
- Vietnam National University, Vietnam

C. Governments and City Authorities:

- Phnom Penh Municipality, Cambodia
- West Java Environmental Protection Agency, Indonesia
- Bandung City, Indonesia
- Public Works and Transportation Institute, Lao PDR
- Bangkok Metropolitan Administration, Thailand
- Pollution Control Department, Thailand
- National Housing Authority, Thailand
- Phuket Municipality, Thailand
- Hue City, Vietnam

D. UEM-related organizations:

- Urban and Regional Development Institute, Indonesia
- Socio-economic and Environmental Research Institute, Malaysia
- Local Government Academy, Philippines
- Municipal League of Thailand, Thailand
- Community Development Institute, Thailand
- Association of Cities in Vietnam, Vietnam

E. Non-governmental Organizations:

- Development and Appropriate Technology, Cambodia
- Balifokus Foundation, Indonesia
- People Care Environment (Warga Peduli Lingkungan), Indonesia
- GenTwoFifteen, Philippines
- Population and Community Development Association, Thailand

Contact

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UEM Specialization

- Urban planning and urban design
- Urban environmental quality management
- Urban governance and management
- Urban infrastructure and services
- Urban disaster and risk management
- Urban poverty and equality
- Urban economics and informal sectors
- Tools for Urban and Environmental Assessments

Urban Environmental Management

Faculty & Research Staff	Research Interests
Dr. Vilas Nitivattananon *Coordinator* vilasn@ait.asia	Management of Urban Infrastructure and Services Capacity Building of Urban Environmental Management Environmental Systems Analysis and Modeling Water Supply and Sanitation Solid Waste Management Economic Analysis and Environmental Assessment Urban Management Information System
Dr. Edsel Sajor esajor@ait.asia	Local Governance Urban Management Land Management Urban Water, Peri-urban Environment STS issues in Biotechnology Environmental Conflict and Resolution Urban Poverty and Urban Environmental Management
Dr. L. A. S. Ranjith Perera ranjith@ait.asia	Eco-sensitive Planning and Architecture Community-based Urban Environmental Management Urban Housing Home-based Enterprises Management and Conservation of Urban Built-environment Urban Environmental Design Strategic Planning and Environmental Management


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NIEVA

Water Engineering and Management

Today's major challenges for water engineers and managers include securing water for people and for food production, protecting vital ecosystems, and dealing with variability and uncertainty of water in space and time. The Water Engineering and Management (WEM) field of study at AIT conducts research to foster an understanding of the complexity of water cycle utilization and management. Research at WEM covers 5 focal areas such as Urban, Agricultural, and Coastal Water, Water resource development, and conservation and Extreme events and risk management. These areas are often linked within the framework of Integrated Water Resources Management (IWRM). WEM reserach aimsto gain deeper understanding of the complexity of water use and water resources management problems and to apply tools and techniques, such as models and optimization schemes, to arrive at solutions and formulate adaptive and mitigating measures to address water related problems in the region.

Most water related problems are natural phenomena that can pose lasting effects on socio-economic development of the countries affected. IWRM oriented research provides strategic relevance and is important from sustainability point of view for the region where most countries are disaster prone. WEM/AIT provides a leading role in research, technology development and capacity building in climate change and water related disaster preparedness, mitigation, recovery and management in the region.

Current /Recent Research

Freshwater vulnerability assessment

Rapid population growth and progressive economic development in the Asian region have escalated the sensitivity of freshwater systems to environmental changes. Recent WEM research highlighted new insights into the vulnerability of the freshwater systems in four major river basins of Asia: Ganges-Brahmaputra-Meghna (GBM), Helmand, Indus and the Mekong River Basin (MRB). Based on sound scientific understanding of the vulnerability context and extensive consultations with stakeholders and experts, the research developed a comprehensive assessment framework that is able to encapsulate main threats to water resources in terms of resource stress, development and use conflicts and ecological insecurity; and the management challenges in coping with threats. Outcomes provided critical points of reference to draw urgent policy attention and accelerated research into climate change impacts on water infrastructure and management practices to reduce freshwater vulnerability in the future.

Climate change impact on Asian deltas

Water, the indispensable driver of all forms of life, will be affected by climate change induced seasonal shift in stream flow, increase in the ratio of winter to annual flows, possibly the reduction in low flows caused by decreased glacier extent or snow water storage, and reduction of groundwater recharge. Faculty members and researchers at WEM have been assessing the impacts and vulnerability of deltas to climate change in Bangladesh, India, Pakistan, Sri Lanka, Thailand and Vietnam. More recently, WEM led a multi-disciplinary team of experts engaged by the WB to study the Climate Change Impact and Adaptation of Bangkok Metropolitan Region (BMR). The research modeled the hydrological impacts of climate change, including sea level rise and storm surge, corresponding to two IPCC scenarios and assessed impacts on the physical infrastructure and estimated damage cost due to climate change. Additionally, a set of adaptation options were proposed to reduce the impact of climate change.

Future Research Areas

- Understanding climate change impacts on water resources in the region
- Water and food security
- Energy-water nexus
- Sustainable hydropower
- Urban water management

Partners

- Royal Thai Government
- HM King of Thailand Scholarship
- Government of Japan
- Government of the Netherlands
- Republique Francaise
- Centre de cooperation internationale en recherche agronomique pour le développement (CIRAD)
- Ministry of Agriculture and Cooperatives (MOAC), Thailand
- Cooperative Research Network (CRN), Thailand
- Danish International Development Agency (Danida)
- Royal Irrigation Department (RID), Thailand
- Kasetsart University, Thailand
- King Mongkut's Institute of Technology, Thailand
- Rajamangala Institute of Technology, Thailand
- Higher Education Commission (HEC), Pakistan
- Greater Mekong Sub-region, ASEAN
- Ministry of Education and Training (MOET), Viet Nam
- Asian Development Bank
- Swedish International Development Cooperation Agency
- Electricity of Viet Nam (EVN)
- United Nations Environment Program (UNEP)
- AIT Alumni Association

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WEM Specialization

- Watershed Hydrology
- Hydrologic & Water Resources Modeling
- Integrated Water Resources Management
- Irrigation and Drainage Engineering
- Land and Water Conservation and Management
- Hydrologic and Environmental Monitoring and Modeling
- Hydraulic Engineering
- Coastal Engineering
- Flood Forecasting and Modeling
- Water Governance & Institutions
- Water Policy
- Water Economics
- Flow Through Porous Media
- Groundwater Development and Management
- Conjunctive Use of Surface and Groundwater
- Modeling of Flow and Sediment Transport in Waterways and Flood Plains
- Risk Analysis and Optimization of Flood Control Structures and Water Resources System
- Forecasting of Flood Runoff

Water Engineering and Management

Faculty & Research Staff	Research Interests
Dr. Mukand Singh Babel *Coordinator* msbabel@ait.asia	Watershed Hydrology Hydrologic and Water Resources Modeling Integrated Water Resources Management Water Supply and Distribution System Climate Change
Dr. R.S. Clemente clemente@ait.asia	Irrigation and Drainage Engineering Land and Water Conservation and Management Hydrologic and Environmental Monitoring and Modeling
Affiliated/Visiting Faculty	
Dr. Sutat Weesakul sutat@ait.asia	Hydraulic Engineering Coastal Engineering Flood Forecasting and Modeling
Dr. Sylvain Perret sylvain@ait.asia	Water Governance and Institutions Water Policy Water Economics Socioeconomics and Rural Development Irrigation Management Integrated Dynamic Modeling
Adjunct Faculty	
Prof. A. Das Gupta adg@ait.asia	Flow Through Porous Media Groundwater Development and Management Conjunctive Use of Surface and Groundwater
Prof. T. Tingsanchali tawatch@ait.asia	Modeling of Flow and Sediment Transport in Waterways and Flood Plains Risk Analysis and Optimization of Flood Control Structures and Water Resources System Forecasting of Flood Runoff

Research and Outreach Centres and New Fields of Study

intERLab

Nanotechnology Center of Excellence

AIT Extension

ACECOMS

Regional Network Office for Urban Safety (RNUS)

WHO Collaborating Center

ASEAN Regional Center of Excellence on MDGs

Asian Center for Soil Improvement and Geosynthetics (ACSIG)

Asian Center for Transportation Studies (ACTS)

Information and Communications Technologies

Agribusiness Management Program

Gender, Transportation, and Development Program

Habitech Center

Thailand Accident Research Center (TARC)

Geoinformatics Center

International Ferrocement Information Center (IFIC)

intERLab

www.interlab.ait.asia

The Internet Education and Research Laboratory (intERLab), the first of its kind in Asia, was launched at AIT in December 2003. IntERLab is a regional centre for internet human resources development, helping to train and educate people from the Asia-Pacific region, especially from the Greater Mekong Sub-region, in Information and Communication Technology (ICT). The intERLab project has been endorsed by Thailand's ICT Ministry to help enable countries in the region to keep up with rapid developments in the ICT field. The concept of establishing a fixed location for internet human resources development has been discussed and endorsed by leading Asia-Pacific internet organizations and several leading research institutions in Asia-Pacific and Europe.

Nanotechnology Center of Excellence

www.nano.ait.asia

The Center of Excellence in Nanotechnology was specifically launched to facilitate research on the application of nanoparticles, which is suitable for addressing developmental issues utilizing this burgeoning field of knowledge. Nanotechnology in the Asian Institute of Technology is new but has a broad significance and potential to contribute to the regions needs and focus to develop this field of expertise jointly with the National Nanotechnology Center, Thailand of the NSTDA. AIT's interdisciplinary offerings are tailor-made opportunities to develop competence in nanotechnology in the region. Current activities at AIT include, but not exclusively, work on nanoparticles, nanomaterials, devices and sensors in the School of Engineering & Technology since 2003. Extensive collaborations in nanotechnology applications have been built up with several European and North American Universities and other top Universities and research institutes in Asia Pacific region has also been established since 2003. Some example activities include applying nanotechnology to solve air pollution in urban areas, utilizing nanoparticles as markers in environmental engineering and management programs and incorporating nanoparticles in agriculture and papermaking enterprises. The Management School is interested to look at the effects of Nanotechnology production methods to the fabrication of materials and products for Thailand.

AIT Extension

www.extension.ait.asia

AIT Extension is the continuing professional development and short course arm of AIT. AIT Extension's programs and services complement those of AIT's graduate degree programs, and thus enable a flexible, client-oriented response to rapidly emerging and changing needs in the region. During the next five years, continuing professional education will become increasingly central to accomplishing AIT's mission as a leading provider of high quality capacity-building and development solutions through education and training, research and consultancy.

AIT Extension offers courses in the following areas - Agriculture and Food Processing, Environment and Natural Resources Management, Education and Training Development, Poverty Reduction and Livelihoods Development, Business Performance, Management and strategy, Development Effectiveness, Public Sector Services and Management, Private Sector Development, Information and Communication Technologies and Infrastructure Development and Public Utility Management.

AIT Extension Departments mission is to provide need-based continuing professional education, training and consultancy using innovative methodologies and best practices and to showcase AIT capabilities in technology, sustainable development and management to decision makers in the region.

Research and Outreach Centres and New Fields of Study

ACECOMS

www.acecoms.ait.asia

Asian Center for Engineering Computations and Software (ACECOMS) established in 1995 is region level, non-profit organization located at School of Civil Engineering (SCE), AIT. The prime mission of the Center is to provide an impetus to the research in engineering computations and to the development of quality computer software tools for engineering applications, their wide spread promotion and the training on their effective use.

The prime mission of the Center is to provide an impetus to the research in engineering computations and to the development of quality computer software tools for engineering applications, their wide spread promotion and the training on their effective use. ACECOMS carries out activities on a non-profit, self-supporting basis and offers equitable financial incentives to associates in the form of royalties and shares in the net income generated from joint activities. Its major activities revolve around software development, professional training and human resource development; research and development, publication and member service and technology transfer through partner networks.

Regional Network Office for Urban Safety (RNUS)

http://www.set.ait.asia/rnus

The regional Network Office for Urban Safety (RNUS) is a collaborative centre jointly operated by the AIT and the University of Tokyo. It's priority task is the promotion of urban safety engineering utilization advanced engineering technologies include remote sensing and GIS.

WHO Collaborating Center

AIT's School of Environment, Resources and Development is one of the World Health Organization (WHO) Collaborating Centres, which are designated by the WHO Director-General to carry out activities in support of the Organization's programmes. AIT has held this post for over four years specifically for activities on water and waste disposal.

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ASEAN Regional Center of Excellence on MDGs

Consciousness for sustainable development is at the peak at present because of mainly rising food and energy insecurity, and potential threats due to climate change. Rapid state of depletion of natural resources, frequent occurrence of natural calamities (drought, flood, cyclones and others), challenge for eradication of poverty, hunger and associated problems are some of the important but interconnected issues that require utmost attention from every quarters for providing safer and secured societies whether it is in the developed and developing countries.

With this background, AIT has been involved over the last three decades in providing academic curricula focused on Millennium Development Goals spreading over three schools and Extension/Outreach units. AIT is being a regional institute with international, multilingual, and cross-cultural attributes, always strives to contribute for the region and beyond through planning, technological, development and management related education, training, research.

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Research and Outreach Centres and New Fields of Study

Asian Center for Soil Improvement and Geosynthetics (ACSIG)

http://www.set.ait.asia/acsig

Most capital cities in Southeast Asia are located in low-land areas associated with softground problems. ACSIG provides a strategic location for advanced technological education, research and outreach activities on the application and effective utilization of ground improvement techniques.

Asian Center for Transportation Studies (ACTS)

http://www.sce.ait.ac.th/acts

The Asian Center for Transportation Studies addresses pressing problems in transportation-related issues in Asian cities and anticipated trends brought about by modernization. ACT activities include modules on intelligent transportation systems, traffic simulation, freight transport, urban road safety and road safety audit.

Information and Communications Technologies

http://www.ict.ait.ac.th/ictweb

The ICT field is a newly established area of study in response to the needs for the offering of a curriculum selectively drawn from the curricula of Telecommunications (TC), Computer Science and Information Management (CSIM). With strong emphasis on communications aspects - rather than on the aggregation of hardware, software, networks, equipment and related industries - ICT recognizes the important role of information services and applications in the creation of a complete ICT infrastructure.

Agribusiness Management Program

As the nature of rural economy of many developing countries of Asia-Pacific region shifts from subsistence farming to commercial food enterprises, a new breed of agribusiness professionals is needed to manage this transformation. The proposed program will cater the unique needs of agribusiness professionals, which comprise of knowledge and skills in elements of agriculture sector policy issues, technology, marketing and finance. Agribusiness professionals are needed in several sectors, including in multinational companies involved in corporate farming, food processing, packaging and marketing, agricultural finance institutions, agricultural cooperatives, animal feed industry, biotechnology industry, fertilizer and pesticide industry, irrigation and mechanical equipment manufacturing, medicinal plants/herbs, and government-initiated rural/agricultural development schemes.

The agri-business management program builds on long standing strengths and experience in research, and internal and external postgraduate teaching in the fields of agricultural production, preservation, processing, agro-and food-industry management and marketing, and in agricultural development. The program focuses on the potential for and contribution of the agribusiness industry in developing economies. It is aimed at enhancing small business entrepreneurship among primary producers of agri-food products, and traders and other market intermediaries in the value chain. The course is appropriate for entrepreneurs themselves and also for people working in the public sector and non-governmental organizations. Entrepreneurs and others will be enabled to take advantage of opportunities within the agri-food and related sectors, and increase the contribution of these sectors within public and national objectives.

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Gender, Transportation, and Development Program

http://www.genderandtransport.ait.asia

Asian Institute of Technology implements the Capacity Building for Gender, Poverty and Mobility Analysis of Road Transportation Development in GMS Region with the support from the Japan-ASEAN solidarity fund of ASEAN Foundation. The project focuses on four countries in GMS, namely, Cambodia, Lao PDR, Myanmar and Vietnam.

The ASEAN region has historically experienced high intra-mobility of goods and people, but in the recent years, the quantum of such mobility has increased dramatically. Various factors have contributed to this increase, including economic disparity within the region; differences in economic/ employment/ business opportunities; transportation and communication infrastructure development, education opportunities, and a wider network of migrants in major cities and industrial areas in the region.

The largest factor is the heavy investment in the construction and renovation of road networks. Road networks, which are important for regional integration within ASEAN, are critical for the less developed member countries, especially those in the Greater Mekong Sub region (GMS) countries. Recognizing this, bilateral and regional financial institutions including the governments in ASEAN region, supported heavily to improve the road network. The fact that people move both within and out of the region has implications not only for the well being of migrants themselves, but also for the sending and receiving communities.

This project aims to fill this gap in the capacity for gender, poverty and mobility analysis in road infrastructure development among government officers in four GMS countries, namely Lao PDR, Cambodia, Vietnam, and Myanmar.

Research and Outreach Centres and New Fields of Study

Habitech Center

http://www.habitech.ait.asia

The Habitech System is an innovative construction process implemented widely for housing, institutional and commercial building projects in the region. Its activities include research and outreach activities such as training in production and construction, provision of services associated with projects implemented by various organizations, agencies or the private sector. Habitech International installs building material production facilities of prefabricated modular interlocking concrete blocks worldwide for residential, institutional and commercial building construction.

Thailand Accident Research Center (TARC)

http://www.tarc.ait.asia

The Accident Research Center is an offspring of MOTC's Road Safety Master Plan acknowledging the lack of information on accidents in Thailand and the need to establish TARC. The support of TARC comes joint from the Department of Highways, Volvo Car Corporation and AIT. TARC provides academic backup and a base for road safety research.

Geoinformatics Center

http://www.geoinfo.ait.asia

The Geoinformatics Center is dedicated to development and promotion of remote sensing research and activities in Asia-Pacific. Its mandate is to share satellite data, research results and experiences with researchers in the region. Various research facilities are established especially, NOAA AVHRR receiving station and Terra/Aqua MODIS receiving station, to support research on global environmental studies.

International Ferrocement Information Center (IFIC)

http://www.set.ait.asia/ific

IFIC coordinates the activities of the International Ferrocement Society (IFS) including the publication of an in-house Journal of Ferrocement. It conducts continuing education courses and sponsored research projects. Its members include engineers, architects, students researchers and all those interes in low cost construction materials.

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