2.1 Mission

School of Engineering and Technology (SET) is the synergistic integration in November 2005 of the two former Schools, namely, the School of Civil Engineering (SCE) and the School of Advanced Technologies (SAT). Historically, these two schools came into existence only in January 1993 when the Institute reorganized the need to reform its academic structure from smaller-sized units called “Divisions” to larger bodies named “Schools”.

The School of Civil Engineering (SCE) represents the legacy of AIT when it was established with a single field of study in Hydraulics Engineering. Subsequently, other civil engineering fields of study were launched to assist the recovery from the ravages of the Second World War. SCE emphasized on a learning process that combines theoretical problem-solving and real life application of engineering principles. Its research orientation was outward-looking, addressing the actual and anticipated needs of the built environment.

The School of Advanced Technologies (SAT) consisted of fields of study that were launched in response to the needs of the regional industrialization in the second and third decades of AIT’s existence. The School was committed to being international, multidisciplinary centers of excellence in Information, Communications, Industrial Systems, and Space Technologies through education, research and outreach.

The new School of Engineering and Technology amalgamating the School of Civil Engineering (SCE) and the School of Advanced Technologies (SAT) will strive to create synergies between the activities of the two former schools to build up world-class multidisciplinary and cross-disciplinary education, research and outreach activities across the boundaries of traditional fields of knowledge. More interdisciplinary programs shall be launched so faculty members can work effectively across the disciplinary walls. The new school will enhance its academic portfolio by emphatically injecting the “5I” features namely internationality, innovation, integration, information technology and industrial partnership.

In line with the mission of the Institute, the mission of the School of Engineering and Technology is:

To develop highly qualified engineers and technologists who play leading roles in promoting the region’s industrial competitiveness in its integration into the global economy.

More information about school can be accessed at the SET’s homepage [http://www.set.ait.ac.th/](http://www.set.ait.ac.th/).

2.2 Thematic Groups, Fields of Study and Multidisciplinary Programs

CIVIL AND INFRASTRUCTURE ENGINEERING GROUP

Since the founding of AIT, its civil engineering fields have promoted modern methodologies, emerging technologies and innovative materials for the design and
construction of safe and economical infrastructure in the region. The Civil and Infrastructure Engineering group includes the following field of studies:

- Construction, Engineering and Infrastructure Management (CEIM)
- Geotechnical and Geoenvironmental Engineering (GTE)
- Geosystem Exploration and Petroleum GeoenEngineering (GEPG)
- Structural Engineering (STE)
- Transportation Engineering (TRE)
- Water Engineering and Management (WEM)

INDUSTRIAL SYSTEM ENGINEERING GROUP

For several decades, AIT has served in the development of the region by equipping young engineers with the high-tech knowledge required to work in complex industrial environments. Since its inception, the Industrial Systems Engineering (ISE) thematic group at AIT has contributed to this mission by focusing on industrial competitiveness and innovation for sustainable growth in the region. The ISE group is comprised of the following field of studies:

- Mechatronics (MEC)
- Microelectronics (MIC)
- Industrial and Manufacturing Engineering (IME)

INFORMATION AND COMMUNICATIONS GROUP

Information and communications enable access, connections and sharing in turn enable knowledge creation and economic opportunity. The fields in the Information and Communications group are:

- Computer Science (CS)
- Information Management (IM)
- Remote Sensing and Geographic Information Systems (RS-GIS)
- Telecommunications (TC)

Interdisciplinary Programs

- Offshore Technology and Management
- Information and Communications Technologies
- Disaster Preparedness, Mitigation and Management

2.3 Strategic Research Areas

The School of Engineering and Technology has identified broad research areas related to the strengths of its faculty, its curriculum and its existing facilities that are the building blocks for education niches in engineering and advanced technologies.

The following lists the information about the specific focal areas grouped by Fields of Study

Computer Science and Information Management (CSIM)

- Software Engineering and Development; Information and Knowledge Management

Industrial Systems Engineering (ISE)

Design and development of devices and sensors; Automation and control of machines; Product design and integration of machines and processes; Planning, operation, control and logistics of Industrial engineering

Remote Sensing and Geographic Information Systems (RS&GIS)

Remote sensing (RS); Geographic information system (GIS); Global positioning system (GPS); Digital mapping technology; Digital photogrammetry

Telecommunications, Information and Communications Technologies (TC, ICT)

Mobile Communications; Teletraffic and Network Performance Analysis; Focal Area 3: Optical Networks

Advanced Infrastructure Development

- Application of new approaches and concepts in the development of infrastructure including innovative project financing
- PPP/PFI, integrated project management
- Infrastructure asset and valuation management, and infrastructure safety and security

Geotechnical and Geoenvironmental Engineering (GTE)

Sustainable geological exploitation for engineering activities; Design of safe structures; Disaster mitigation and rehabilitation
2.4 Academic Outreach Centers

The School of Engineering and Technology has a wealth of innovative and untapped knowledge database from its masters and doctoral research activities. Many outreach and research centers are set up to transform the knowledge into industrial needs. These centers also serve to transfer the practical aspects and the society impacts of the knowledge and technology back to the class room.

ACECOMS: Asian Center for Engineering Computations and Software

The prime mission of ACECOMS with 29 satellite centers in 21 cities in Asia and other regions carries out research in engineering computations, develops computer software tools for engineering applications, and conducts training in the effective use of latest computing technology. Visit ACECOMS: http://www.acecoms.ait.ac.th/

ACSIG: Asian Center for Soil Improvement and Geosynthetic

ACSIG provides a strategic location for advanced technological education, researches and outreach activities on the application and effective utilization of ground improvement techniques. Visit ACSIG: http://www.set.ait.ac.th/acsig/

ACTS: Asian Center for Transportation Studies

ACTS activities include modules on intelligent transportation systems, traffic simulation, freight transport, urban road safety and road safety audit. Visit ACTS: http://www.set.ait.ac.th/acts/

Geoinformatic Center

Geoinformatic center is dedicated to development and promotion of remote sensing research and activities in Asia-Pacific by sharing satellite data, research results and experiences with researchers in the region. Visit Geoinformatic Center http://www.geoinfo.ait.ac.th/

Habitech Center

Habitech 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. Visit Habitech: http://www.habitech-international.com/index-thai.html

International Ferrocement Information Center

IFIC coordinates the activities of the International Ferrocement Society (IFS) including publication of "Journal of Ferrocement", conducting continuing education courses and sponsored research projects in low-cost construction. Visit ACRoRS: http://www.set.ait.ac.th/ific/

Regional Network Office for Urban Safety

The Regional Network Office for Urban Safety (RNUS) is a collaborative center jointly operated by the AIT and the University of Tokyo for the promotion of urban safety engineering utilizing advanced engineering technologies including remote sensing and GIS. Visit RNUS: http://www.set.ait.ac.th/rnus/

Thailand Accident Research Center

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. TARC provides academic back up and a base for road safety research.

AIT Center of Excellence in Nanotechnology

The Center of Excellence in Nanotechnology is jointly supported by Thailand's Nanotechnology Center (NANOTEC) and AIT, to cultivate and foster multidisciplinary activities including research and education in the applications of Nanotechnology in Developing World. Visit RNUS: http://www.nano.ait.ac.th

2.5 School Governance

Dean of School

WORSAK KANOK-NUKULCHAI, BEng (Hon), Chulalongkorn Univ, Thailand; MEng, AIIT, Thailand; PhD, Univ of California (Berkeley), USA. Professor (Computational Mechanics; Finite Element Methods; Tall Building Static and Seismic Analysis; Bridge Engineering; Microcomputer Software for Structural
Associate Dean

JOYDEEP DUTTA, PhD, IACS, Calcutta Univ, India; BSc (Hon), MSc, North Eastern Hill Univ, India.

Associate Professor
(Functional materials, nanomaterials, Nanoparticles, selforganisation, Biomimetic processes, Polyelectrolyte deposition, Gas sensors, Bio-sensors, optoelectronic devices)
Chapter 3: SET - COMPUTER SCIENCE and INFORMATION MANAGEMENT
FIELDS OF STUDY

3.1 Introduction

Computer Science

This field of study fosters high level teaching and research in computer science 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 curriculum in computer science covers all aspects of computing, with the faculty particularly active in 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 courses and 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. Students are also encouraged to take courses and conduct research in 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.

Information Management

This field of study is a strategic response to society’s changing needs. It will continue to evolve as organizations cope with the proliferation and complexity of new information technologies and services. It is the first of its kind in Southeast Asia.

Information is an essential resource for academic excellence, competitiveness in business and industry, scientific progress, and national development. Like any other resource, information must be managed. 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.

The Information Management curriculum is designed to prepare students to respond to four basic challenges confronting organizations today:

- Planning the effective use of information and communication technologies within organizations;
- Developing corporate and government policies to maximize the benefits resulting from the widespread use of these technologies;
- Improving the strategic management of information resources in business, government, and non-profit organizations; and
- Increasing the productivity and creativity of managers and executives who work with information resources.

3.2 Research Facilities and Laboraties

Organized around ten Unix servers, some of them being multiprocessors, CSIM network comprise about 60 microcomputers, running desktop and engineering applications, scientific and research software and programming languages, with full access to the Internet.

Through AI3 project, a broadband satellite link is available to Japan and other countries in the region. This link is primarily dedicated for research activities in the field of internetworking, like the new generation of Internet IPv6, distributed education, video conferencing, and unidirectional routing. Dedicated laboratories are set-up with specialized equipments. Full wireless coverage in the building allows students to conveniently work with their personal notebook computers.

3.3 Faculty and Research Staff
Full-time Faculty

PHAN MINH DUNG, MSc, PhD, University of Technology, Dresden, Germany.
Professor (Computer and Network Security, Autonomous Computing, Logic Programming, Artificial Intelligence)

PETER HADDAWY, BA, Pomona College, Claremont, USA; MSc, PhD, Univ of Illinois, Urbana, USA.
Professor and Vice President for Academic Affairs (Decision-Theoretic Problem Solving, Probabilities Reasoning, Modeling of User Preferences, Electronic Commerce, Medical Decision Making).

KANCHANA KANCHANASUT, PhD, MSc, Computer Science, University of Melbourne, Australia; Graduate Diploma, Computer Science, BSc Mathematics, University of Queensland, Australia.
Professor and IntERLab Director (Networking and Distributed Computing, Algorithms, Programming Languages).

VLAS WUWONGSE, DEng Systems Science, MEng Control Engineering, BEng Control Engineering, Tokyo Institute of Engineering, Japan.
Professor and Vice President for External Relations (Information Representation, Semantic Web, Digital Libraries).

VATCHARAPORN ESICHAIKUL, BAcc, Chulalongkorn Univ, Thailand; MBA, Oklahoma State Univ; PhD, Kent State Univ, USA.
Associate Professor (Electronic Commerce/Electronic Business, Webbased Information Systems).

Hypermedia, Electronic Government)

SUMANTA GUHA, MS, PhD, University of Michigan, Ann Arbor, USA; PhD, Indian Statistical Institute, Calcutta, India; BSc, MSc, University of Calcutta, India.
Associate Professor (Algorithms, Computer Graphics, Computational Geometry, Robotics)

MATTHEW N. DAILEY, BSc, MSc, North Carolina State University, PhD, University of California, San Diego.
Assistant Professor (Machine learning, Machine vision, Robotics, Systems security).

PAUL JANECZEK, BSEE, USA Military Academy; MSc, Univ of London, UK; PhD, Swiss Federal Inst of Tech, Switzerland.
Assistant Professor (Human-Computer Interaction; Analysis and Design of Information Visualization Systems, Semantic Fisheye Views, Software Engineering and Open-source Software Development, and Information System Development).

3.4 Grants and Sponsored Research Completed in 2007

Database Systems for Advanced Applications
Duration 1-Dec-06 - 31-May-07
Project Investigator Prof. Vilas Wuwongse
Sponsors Participants
Total Contracted Amount (Baht) 1,700,000

Ministry of Science and Technology Virtual Library
Duration 1-Dec-06 to 31-Dec-07
Project Investigator Prof. Vilas Wuwongse
Sponsors Thaksin University
Total Contracted Amount (Baht) 1,000,000

3.5 On-going Grants and Sponsored Research

Argumentation as Foundation for Semantic Grid
Duration 02-Jun-06 to 31-May-09
Project Investigator Prof. Pham Minh Dung
Sponsor European Commission
Total Contracted Amount (Baht) 10,000,000

Building an Integrated leading Euro-Asian higher Education and research community in the field of the Semantic Web
Duration 01-Oct-06 to 30-Sep-09
Project Investigator Prof. Vilas Wuwongse
Sponsor EU (Contract TH/Asia Link/010 (111084)
Total Contracted Amount (Baht) 2,960,964

Enhancement of Efficciency in Inventory Management of Corrugated Paper Carton Manufacturer using RFID Technology
Duration 01-Jun-07 to 01-Aug-08
Project Investigator Dr Paul Janecek
Sponsor RTG and LIKOTIMO
Total Contracted Amount (Baht) 2,000,000

Improvement of Logistics and Planning for Fashion Merchandise
Duration 01-Jun-07 to 01-Aug-08
Project Investigator Paul Janecek
Sponsor RTG and BTNC Company
Total Contracted Amount (Baht) 1,500,000

Ministry of Science and Technology: Content Management Systems for Tourism
Duration 25-Nov-07 to 25-May-08
Project Investigator Prof. Vilas Wuwongse
Sponsor Thaksin University
Total Contracted Amount (Baht) 800,000

Video Surveillance using Face Detection and Human Behaviour Profiling
Duration 01-Apr-07 to 31-Mar-08
Project Investigator Dr Matthew Dailey
Sponsor RTG
Total Contracted Amount (Baht) 500,000

ANNUAL REPORT ON RESEARCH 2007
3.6 Publications

Refereed Journals


Leelapatra, W., Kanchanasut, K. and Lursinsap C., Displacement BDD and Geometric Transformation of BDD Encoded Image, Pattern Recognition Letters, Elsevier (accepted)


Refereed Books / Chapters


Conference Proceedings


ANNUAL REPORT ON RESEARCH 2007

Conference on Computers in Education. Hiroshima, Japan.


3.7 Doctoral Students’ Dissertation

Computer Science

Geometric Transformations of Binary Decision Diagram Encoded Images
By: Watis Leelapatra
Supervisor: Prof. Kanchana Kanchanasut

3.8 Masters Students’ Theses and Research Studies

Computer Science

An Interactive 3D Campus Navigator using Maya and Virtools
By: Wang Jing
Supervisor: Dr. Sumanta Guha

Applications of MLS Surfaces
By: Nguyen Tan Khoa
Dr. Sumanta Guha

Automated Exudate Detection on Thai Diabetic Patients’ Retinal Images
By: Khine Thet Nwe
Supervisor: Dr. Matthew Dailey

Chat Tracking for Medical Problem-based Learning
By: Long Hoang
Information Management

An Adaptive Model for Customer Targeting
By: Theechat Chatvijit
Supervisor: Dr. Vatcharaporn Esichaikul

Analysis of the Successes and Failures of E-Marketplaces for Small and Medium Size Enterprises in the Greater Mekong Sub-Region
By: Anjali Sharma
Supervisor: Dr. Paul Janecek

An Application Framework for Ubiquitous Supply Chain Management
By: Thanit Youruchatangern
Supervisor: Dr. Paul Janecek

An Integrated Complaint Management System for Thai E-Government
By: Patcharaporn Panwong
Supervisor: Dr. Vatcharaporn Esichaikul

An Ontology-Based Approach to Designing Information Architecture of Websites
By: Fedor Valentinnovich Bakalov
Supervisor: Prof. Vilas Wuwongse

A Machine Vision System for Coral Reef Monitoring
By: Rassarin Chinnachodteeranun
Supervisor: Dr. Matthew Dailey

A Personal Ontology-based Content Management System
By: Khine Zaw Win Myint
Supervisor: Dr. Paul Janecek

A Stock Forecasting System for Supporting Investors' Decisions on the Stock Exchange of Thailand
By: Soontarin Nupap
Supervisor: Dr. Vatcharaporn Esichaikul

Business Intelligence for Supporting Online Business Decisions in Thailand
By: Anucha Thodsanit
Supervisor: Dr. Vatcharaporn Esichaikul

Case-based Reasoning for University Student Performance Prediction
By: Nguyen Thi Ngoc Hue
Supervisor: Prof. Peter Haddawy

Competitive Advantage of Online Service Desk for Customer Service: The Case of A Telecommunication Company
By: Zhu Jinbo
Supervisor: Dr. Vatcharaporn Esichaikul

Development of Wiki Collaboration Space for E-Learning
By: Win Myint Aung
Supervisor: Dr. Vatcharaporn Esichaikul

Faceted Folksonomy: Design and Evaluation of a Tool for Classifying and Sharing Documents
By: Nguyen Nhu Khan
Supervisor: Dr. Jaakko Kurhila

Implementing Cometvis: A Visual Tool for Evaluation of Student Contribution in Collaborative Medical Tutoring
By: Louie Julius Bagoyado
Supervisor: Dr. Paul Janecek

Intelligent Course Recommendation System: An Artificial Neural Network Approach
By: Cai Hui
Supervisor: Dr. Paul Janecek

Volume Cost Based Mesh Simplification
By: Tep Vuthy
Supervisor: Dr. Sumanta Guha

Research Study: A Governance Framework for Improving Information Flow in NGOs
By: Seow Yoke May
Supervisor: Dr. Paul Janecek

Research Study: An Ontology-based Course Catalog System
By: Nang Mo Phaung
Supervisor: Dr. Paul Janecek

Research Study: Aircraft Maintenance Management System for AEROTHAI
By: Pongsaree Buakant
Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Business Process Modeling: Case Study of AIT Admission Process
By: Le Tran Nguyen
Supervisor: Dr. Sumanta Guha

Research Study: Enhancing the Caller-Agent Relationship for Skill-Based Routing in Call Centres
By: Siddharth Arnab Sarkar
Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Implementation of an Intranet Portal: Case Study for LRC Web Portal Solution
By: Nguyen Van Bac
Supervisor: Dr. Sumanta Guha

Research Study: Proposing a Government to Business Model for Administrative Management at the Ministry of Industry in Vietnam
By: Nguyen Ngoc Hai
Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Strategic Information Technology Planning: A Case Study of Electricity of Vietnam
By: Pham Ngoc Hien
Supervisor: Dr. Vatcharaporn Esichaikul

Research Study: Towards Smarter Supply Chains: Four Case Studies
By: Quratulain Naqvi
Supervisor: Dr. Matthew Dailey

Research Study: Truck's Crew Scheduling using a Multi-Agent Approach: A Case Study of Sabeco Beverage Company, Vietnam
By: Tran Tan Chinh
Supervisor: Dr. Vatcharaporn Esichaikul
4.1 Introduction

The Construction, Engineering and Infrastructure Management field trains professionals to play leading roles in the international construction industry and in infrastructure development and management. It offers courses in four levels - operations, project, strategic issues and corporate issues. It prepares students to become effective managers and decision-makers familiar with modern techniques of construction management, engineering management and infrastructure management.

The field’s courses are delivered based on a hierarchical knowledge scale that considers principles and fundamentals, applications (tools and techniques), and emerging issues. In offering courses spanning fundamentals to advanced, the emphasis is on shifting from classical to innovative knowledge.

4.2 Faculty and Research Staff

Full-time Faculty

STEPHEN O OGUNLANA, BSc, MSc, Univ of Ile, Nigeria; PhD, Loughborough, Univ of Tech, UK. Professor (Construction Economics; Project Management; Productivity Improvement, Dynamic Modeling and Simulation, Human Resources Management)

CHOTCHAI CHAROENNGAM, BEng, King Mongkut’s Inst of Tech, Thonburi, Thailand; MS, Univ of Kansas; PhD, Univ of Texas at Austin, USA. Associate Professor (Project Planning, Scheduling, and Controls; Construction Productivity Improvement; Information Technology in Construction Management; Construction Disputes and Litigation)

BONAVENTURA H W HADIKUSUMO, BEng, Univ of Diponegoro, Indonesia; MEng, AIT; PhD, Univ of Hong Kong. Assistant Professor (Construction Information Technology; Construction Site Safety, Virtual Reality application in construction; Web-based project design and management; Design for X-ability; Construction simulation; Construction site safety; Cost control)

PANNAPA HERABAT, BS, MS, PhD, Carnegie Mellon Univ, USA. Assistant Professor (Asset Management System; Pavement Management System; Bridge Management System (BMS); Infrastructure Economics; and Computer-Aided Engineering Management)

4.3 Grants and Sponsored Research

Completed in 2007

Construction Work Performance under Bovis Lend Lease Safety and Health Management System
Duration Dec-06 - Dec-07
Project Investigator Dr. B.H.W. Hadikusumo
Sponsors Bovis Lend Lease (Thailand) Ltd.
Total Contracted Amount (Baht) 100,000

EU-Asia Network of Competence Enhancement on Public-Private Partnerships (PPPs) in Infrastructure Development
Duration Apr-04 - Apr-07
Project Investigator Prof. Stephen O. Ogunlana
Sponsors The European Union
Total Contracted Amount (Euro) 400,000

Seminar on Dispute Prevention and Resolution on Mega Construction Projects
Duration 1-Oct-06 - 30-Sep-07
Project Investigator Prof. Stephen O. Ogunlana
Sponsors Warner/PPP
Total Contracted Amount (Baht) 418,689.70

4.4 On-going Grants and Sponsored Research

The Strategic Portfolio Program Management
Duration 1-Oct-05 - 30-June-08
Project Investigators Dr. Chotchai Charoenngam, Dr. B.H.W. Hadikusumo
Sponsors Ministry of Foreign Affairs
Total Contracted Amount (Baht) 4,978,000

Development Strategy for Professional Resources of Hong Kong’s Construction and Related Engineering Service Sector
Duration 15-Nov-07 - 31-Dec-08
Project Investigator Dr. B.H.W. Hadikusumo
Sponsors Hong Kong University (HKU)
Total Contracted Amount (Baht) 250,000

Professional Masters in Project Management in Construction
Duration 23-Jul-07 - 20-Dec-08
Project Investigators Dr BHW Hadikusumo, Dr Chotchai Charoenngam, Prof Stephen
Ogunlana
Kovalainen, Dr Poompat Saengudomlert
Sponsors PetroVietnam Company, Vietnam
Total Contracted Amount (Baht) 11,856,100

4.5 Publications

Refereed Journals


Refereed Books/Chapters


4.6 Doctoral Students’ Dissertation

Construction Engineering and Management

An Examination of the Relationship between Risk Allocation and Project Success on PPP Project through Good Project Governance Assessment: Case Studies of Tollway Projects in Indonesia, Thailand and Vietnam

A Study of Safety Management System and Audit in Oil and Gas Construction Projects in Ba Ria - Vung Tau, Vietnam
By: Phan Thanh Hai
Supervisor: Dr. B. Harimurti W. Hadikusumo

An Evaluation of Client Roles in Projects Procured Through the Traditional Construction Process in Ho Chi Minh City, Vietnam
By: Tran Tan Tin
Supervisor: Prof. Stephen O. Ogunlana

Analysis of the Office Market Demand and Supply Using Systems Dynamics Approach
By: Apinun Tantiviyapan
Supervisor: Dr. B. Harimurti W. Hadikusumo

Application of Neuro-fuzzy Networks to Forecast Cost and Duration Variances for Building Projects in Vietnam
By: Pham Hiep Luc
Supervisor: Dr. Chotchai Charoenngam

Business Performance Measurement Framework for Construction Organizations
By: Le Phi Hai
Supervisor: Prof. Stephen O. Ogunlana

Case Study of Concession Contract in the Public Private Partnership: Financial Clauses Investigation of Don Muang Tollway and Second Stage Expressway in Thailand and Cipularang Tollway in Indonesia
By: Fredy Kurniawan
Supervisor: Dr. Chotchai Charoenngam

Cost Management Behavior under Cost Overruns of Japanese and Thai Construction Companies
By: Narumon Jongcharoensub
Supervisor: Dr. Chotchai Charoenngam

Effect of Globalization on the Supply Chain Competitiveness of Large Scale Contractors : A Case Study
By: Arasavindiran Mariappan
Supervisor: Dr. Chotchai Charoenngam

Evaluation of Effective Design in Architectural Process
By: Nguyen Kim The Anh
Supervisor: Dr. Chotchai Charoenngam

Factors Influencing the Financial Crisis that Affect Small and Medium-Sized Construction Enterprises in Thailand
By: Chanagarn Watanantachai
Supervisor: Dr. Chotchai Charoenngam

Integration of Capital Investment Analysis with Public Interest and Value for Money in Mass Rapid Transit Project in Thailand
By: Aut Thaitrong
Supervisor: Dr. Chotchai Charoenngam

Knowledge Sharing Process within Power Engineering and Consulting Company: A Case Study of Vietnam
By: Dinh Truong Giang
Supervisor: Dr. Chotchai Charoenngam

Making Construction Employment Decent Work: A System Dynamics Investigation
By: Ramya Kanaganayagam
Supervisor: Prof. Stephen O. Ogunlana

Quality Function Deployment Approach in Apartment Construction Project: A Case Study
By: Pham Nguyen Quynh Huong
Supervisor: Dr. B. Harimurti W. Hadikusumo

Risk Approaches for Making Go / No-Go Decisions by Thai Consulting Engineering Firms

4.7 Masters Students’ Theses and Research Studies

Construction, Engineering and Infrastructure Management

Construction, Engineering and Infrastructure Management

A Study of Safety Management System and Audit in Oil and Gas Construction Projects in Ba Ria - Vung Tau, Vietnam
By: Phan Thanh Hai
Supervisor: Dr. B. Harimurti W. Hadikusumo

An Evaluation of Client Roles in Projects Procured Through the Traditional Construction Process in Ho Chi Minh City, Vietnam
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Application of Neuro-fuzzy Networks to Forecast Cost and Duration Variances for Building Projects in Vietnam
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Business Performance Measurement Framework for Construction Organizations
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Case Study of Concession Contract in the Public Private Partnership: Financial Clauses Investigation of Don Muang Tollway and Second Stage Expressway in Thailand and Cipularang Tollway in Indonesia
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Effect of Globalization on the Supply Chain Competitiveness of Large Scale Contractors : A Case Study
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Supervisor: Dr. B. Harimurti W. Hadikusumo

Risk Approaches for Making Go / No-Go Decisions by Thai Consulting Engineering Firms
Risk Management in Port and Waterway Projects: A Case Study of the Southern Focal Economic Area of Vietnam
By: Nguyen Viet Dung
Supervisor: Prof. Stephen O. Ogunlana

Risks in the Construction of Hydropower Tunnels In Vietnam
By: Dau Xuan Thuy
Supervisor: Prof. Stephen O. Ogunlana

Safety Communication in Construction Projects
By: Somjate Chatutewaprasit
Supervisor: Dr. B. Harimurti W. Hadikusumo

Strategies for Attracting Capital Investment in Independent Power Producers (IPPs) in Vietnam
By: Nguyen Van Long
Supervisor: Dr. Chotchai Charoenngam

Research Study: Technology Selection Practises in Building Construction Projects through the Perspectives of Design Consultants
By: James Suvanaphen
Supervisor: Dr. Chotchai Charoenngam
Chapter 5: SET – DESIGN & MANUFACTURING ENGINEERING AND
INDUSTRIAL ENGINEERING & MANAGEMENT FIELDS OF STUDY

5.1 Introduction

Design and Manufacturing Engineering

Design and Manufacturing Engineering field of study prepares students to manage advanced manufacturing technologies, focusing on the selection, use, control, design and integration of computer controlled manufacturing systems. The Design and Manufacturing Engineering curriculum reflects the objective of imparting fundamental knowledge to develop the ability to address the complex interaction between manufacturing, computers and industry.

Industrial Engineering and Management

Industrial Engineering and Management field of study prepares students for manufacturing management and decision support positions in industry and public sector, by equipping them with a broad range of decision making skills for a variety of applications. The IE&M curriculum reflects the objective of imparting fundamental knowledge to develop the ability to address complex industrial issues, emphasizing on how to design, run, control, and optimize the production systems.

5.2 Research Facilities and Laboratories

IEM and DME fields share all the laboratory facilities with Mechatronics and Microelectronics fields of study. There are several well equipped laboratories with the primary function of supporting the students and faculty for teaching and research and to conduct outreach programs.

Computer Integrated Manufacturing (CIM) Laboratory

The Computer Integrated Manufacturing (CIM) laboratory was officially inaugurated on September 23, 1991. It provides the hardware and software support for Industrial Systems Engineering. Many research activities have been undertaken in close collaboration with industry and government sectors in the area of Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), Computer Numerical Control (CNC), Rapid Prototyping (RP) and Medical Technology. The CIM Laboratory also provides specialized training and consultancy services in CAD, CAM, CNC Machining, Reverse Engineering, Rapid Prototyping, Packaging Technology, Flexible Manufacturing Systems [FMS], and Development of Postprocessor for 5-axis CNC.

The CIM Laboratory is equipped with production and training CNC machines including EMCO TURN242 industrial production CNC lathe, EMCO VMC200 CNC vertical machining center for universal production, MAHO MH600E2 5-axis universal milling and boring machine, an EMCO compact 5 CNC, an EMCO F1 CNC, a LVD CNC press brake, a LVD water-jet cutting CNC, ZOLLER tool presetting system, and a Mondiale Gallic G-420 Industrial CNC lathe, EMCO CNC training system. The available CAD/CAM software includes UNIGRAPHICS NX4, Master CAM 9.1, Mechanical Desktop 6, AutoCAD Inventor Series, SolidWorks 2005, CAM 2000, Mimics 6.3 & Magic 5.4.

Metrology Laboratory

Metrology Laboratory provides the hardware and software support for Industrial Systems Engineering. Metrology Laboratory is equipped with Measuring Instruments (Zeiss CMM, Mitutoyo Profile Projector, Taylor Hobson Surface Roughness Tester, Lab View Hardware & Software).

Mechatronics and Automation Laboratory

The Mechatronics and Automation laboratory is well-equipped with many PLC systems (S5, S7-200/300/400, INDRAAT, BOSCH), distributed control systems (PCS7), operator panels (OP5, OP17/DP, OP35), PC-based human machine interface package (WINCC), and networked fieldbuses (PROFIBUS, INTERBUS, SERCOS).

The lab has mobile robots (NOMAD, PIONEER 2), Robot arms (CRS), Industrial Robot (KUKAKR15), a self-made Open Architecture CNC machine, CNC control systems (MTC200, SINUMERIK 81 00/8400), image processing systems (DVT, MATROX), and FPGAs (XILINX-1i VIRTEX PRO, ALTERA). Software packages such as SYNOPSYS IC Design, ANSYS, ADAMS, and many types of special sensors and actuators are also available for the research use.

Many research activities have been undertaken in close collaboration with industry and government sectors in the area of industrial automation, robotics,
control, system design and integration. Some examples of the research are: medical teleanalyzer, automated visual inspection systems, MEMS design, autonomous flying robot, automating centrifuge machines, autonomous underwater robot, automating crystallization process, etc.

**Simulation Laboratory**

This lab is equipped with networks of Pentium PC for general applications and internet access, high end CAD/CAM & Simulation software such as ARENA and AutoMOD. In addition, a high performance computer facility with parallel cluster is also available for research use.

**Microelectronics Laboratory**

The microelectronics facilities consist of two main laboratories:

- **IC Design Lab**
- **Nanotechnology**

The Integrated Circuit Design laboratory gives students access to a wide variety of professional software applications including ANSYS, Orcad, ModelSim SE, Xilinx ISE, Synopsys, Leonardo Spectrum LS, Tanner (S-Edit for Schematic Capture, T-Spice and W-Edit for Simulation and L-Edit for Physical Layout) are some of the software which are available. All the computers are networked through a high end (Intel XEON) server which is secure from external attacks. The laboratory facilities are used for Analog and digital circuit design, Microchip design and fabrication, MEMS, Microactuators and micro-sensors design, Computational electronics, etc. The fabrication is done in cooperation with National Electronics Technology Center (NECTEC) and the National Science and Technology Development Administration (NSTDA) located in the nearby Science Park.

The Nanotechnology Laboratory consists of a chemistry lab, instrumentation room and an electronics laboratory. The chemistry laboratory is equipped with standard chemical tables and hood for carrying out wetchemical processing. The instrumentation room consists of equipments like optical spectrophotometer, microscope etc. The electronics laboratory is equipped with digital oscilloscopes, signal generators, power supplies, standard voltage and current meters as well as stocked with discrete devices for testing and research. This laboratory is used for teaching and research especially in the processing related subjects.

### 5.3 Faculty and Research Staff

**Full-time Faculty**

**MARIO T TABUCANON, BSEE, BSME, Cebu Inst of Tech, Philippines; MEng, DEng, AIT, Thailand. Professor (Multiple Criteria Decision Making; Operations and Production Management; Operations Research; Project Management; Systems Modeling)**

**ERIK L J BOHEZ, Burgerlijk WerktuigKundig Electro-Technisch Ingenieur, Rijks Universiteit Gent (State University Ghent, Belgium); Kandidatuur Burgerlijk Ingenieur, Rijks Universiteit Gent (State University Ghent, Belgium); Technisch Ingenieur Electro-Mechanica, Hoger Technisch Instituut Sint Antonius Gent, (High Technical Institute Saint Antonius Ghent; Belgium). Associate Professor (Computer Aided Design; Computer Aided Manufacturing; Computer Graphics; Computer Numerical Control; Fractal and Holistic Manufacturing; Robust Control; Simulation of Metal Removal; Virtual Axis Machine) [CNC/CAD/CAM; Five Axis Machining; Holonic and Fractal Manufacturing; Mold and Die Design, Eco-Design]**

**VORATAS KACHITVICHYANUKUL, BS, Natl Taiwan Univ; MEng, AIT, Thailand; PhD, Purdue Univ, Indiana, USA. Associate Professor (Simulation; ERP; Scheduling, Metaheuristics; Parallel Computing) [Planning and Scheduling Systems; Enterprise Resource Planning Systems; Supply Chain Modeling and Analysis; Discrete Event Simulation Software Development; Manufacturing System Simulation; Manufacturing Decision Support Systems; Just-in-Time Manufacturing System]**

**PIKUT KOOMSAP, BEng, Thammasat Univ, Thailand; MSc, Univ of Louisville; PhD, Pennsylvania State Univ, USA. Assistant Professor (Sensing and Control for Manufacturing Processes and Systems; Laser Applications in Manufacturing; Rapid Prototyping; Condition-Based Maintenance; Continuous Improvement) [Rapid Prototyping; Sensing and Control for Manufacturing Processes and Systems; Laser Applications in Manufacturing; Condition-Based Maintenance; Continuous Improvement]**

**HUYNH TRUNG LUONG, BEng, Ho Chi Minh City Univ of Tech, Vietnam; MEng; DEng, AIT, Thailand. Assistant Professor [Emergency inventory policies and inventory policies for perishable products; Supply...**
Biodegradable Polylactide and Natural Rubber for Multicolor Articles Rapid Prototyping
Duration Dec-05 - Dec-07
Project Investigator Dr. Pisut Koomsap
Sponsors Royal Thai Government
Total Contracted Amount (Baht) 785,000

Development of an Automatic Tide Sensing Unit for Tsunami Early Warning System
Duration 1-Nov-05 – 30 June-07
Project Investigator Dr Manukid Parnichkun
Sponsors RTG Joint Research Project FY 2005
Total Contracted Amount (Baht) 1,000,000

Evaluation of the Modernization of Technical Education in Production Technology
Duration Jul-01 - Dec-07
Project Investigator Assoc. Prof. Erik L.J. Bohez
Sponsors EMCO/RIT
Total Contracted Amount (Baht) 450,000

Product Design and Development for CCC Polylitoffs Co.
Duration 1-Feb-07 – 30-Nov-07
Project Investigator Dr. Pisut Koomsap
Sponsors CCC Ployolefins Co. Ltd, Thailand
Total Contracted Amount (Baht) 175,480

5.5 On-going Grants and Sponsored Research

Asia-Pacific Industrial Engineering and Management Systems Conference 2006
Duration 1-Jul-05 - 30-Jun-08
Project Investigator Dr Voratas Kachivichyanukul
Sponsors Participants
Total Contracted Amount (Baht) 8,200,000

Decision Support System for Beverage Industry
Duration 1-Jul-07 - 31-Aug-08
Project Investigator Dr Voratas Kachivichyanukul
Sponsors Royal Thai Government and Green Spot Company Ltd, Thailand
Total Contracted Amount (Baht) 900,000

Design and Construction of Online Biochemical Oxygen Demand Sensors as Rapid BOD Assay Devices for Monitoring the Quality of Natural Waters and Wastewater Effluents
Duration 1-May-07 - 30-Apr-08
Project Investigator Dr Pisut Koomsap
Sponsors Royal Thai Government
Total Contracted Amount (Baht) 900,00

Development of Rapid Prototyping System for Sanitary Ware Product
Duration 1-Jun-07 - 30-Jun-09
Project Investigator Dr Pisut Koomsap
Sponsors Royal Thai Government and Siam Sanitary Ware Industry, Thailand
Total Contracted Amount (Baht) 2,500,000

Hot End and Cold End Online Monitoring and Communication System
Duration 1-Jun-07 - 31-May-08
Project Investigator Dr Erik Bohez
Sponsors Royal Thai Government and Bangkok Glass Company, Thailand
Total Contracted Amount (Baht) 2,000,000

PET-Recycling
Duration 20-Aug-07 - 20-Feb-08
Project Investigator Dr Erik Bohez and Prof Sudip Rakshit
Sponsors Indorama Thailand
Total Contracted Amount (Baht) 200,000

Product Design and Development for Thai Acrylic Fibre Co. Ltd
Duration 1-Jun-07 - 30-Apr-08
Project Investigator Dr Pisut Koomsap
Sponsors Thai Acrylic Fibre Co. Ltd
Total Contracted Amount (Baht) 235,400

Project on Human Resource Development in Multi-Axis CNC Machine for EGAT
Duration 1-Feb-07 - 31-Dec-08
Project Investigator Dr Erik Bohez
Sponsors EGAT Public Company, Thailand
Total Contracted Amount (Baht) 750,000

Thai 5-Axis Open Architecture Small Cnc
Duration 1-May-07 - 30-Apr-08
Project Investigator Dr Erik Bohez
Sponsors Royal Thai Government and Grand Spar Company, Thailand
Total Contracted Amount (Baht) 1,400,000

5.6 Publications

Sponsored Research


Conference Proceedings


Other Publications


5.7 Doctoral Students’ Dissertation

Design and Manufacturing Engineering

A New Geometric Modeling Approach of Anisotropic Yarn Structure
By: Keartisak Sripateep
Supervisor: Assoc. Prof. Erik L. J. Bohez

Aesthetic Evolutionary Approach for Jewelry Design based on IFS Fractals
By: Somlak Wannarumon
Supervisor: Assoc. Prof. Erik L.J. Bohez

Feature-based Sequence Planning and Assembly System Design Using Petri Net
By: Hamid Ullah
Supervisor: Assoc. Prof. Erik L. J. Bohez

Intelligent Collision Detection and Avoidance for Five-Axis NC Machining
By: Tran Duc Tang
Supervisor: Assoc. Prof. Erik L. J. Bohez

MIMO Nonlinear Process Using Neuro-fuzzy system
By: Nguyen Quoc Dinh
Supervisor: Dr. Nitin Afzulpurkar

5.8 Masters Students Theses and Research Studies

Design and Manufacturing Engineering

Design and Control of a Filling Head Nozzle for SVM Rapid Prototyping
By: Syed Azkar-Ul-Hasan
Supervisor: Dr. Pisut Koomsap

Design and Manufacturing of a Two Axis Servo Table Abrasive Waterjet Machining
By: Nguyen Van Ut
Supervisor: Dr. Pisut Koomsap

Error Identification and Compensation Due to Elastic Deformation in CNC Milling Machines
By: Shoukat Nawaz
Supervisor: Assoc. Prof. Erik L. J. Bohez
Chapter 6: SET – GEOTECHNICAL AND GEOENVIRONMENTAL ENGINEERING
FIELD OF STUDY

6.1 Introduction

Beside the traditional areas of foundation engineering, earth structures, underground excavations, land subsidence, and landslide mitigations, geotechnical engineers and researchers are increasingly involved in new and dynamic areas of ground improvement, geosynthetic engineering, land reclamation, lightweight materials, forensic engineering and the effective recycling of waste materials.

Furthermore, geotechnical engineers are increasingly challenged to solve environmental problems related to 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 soil erosion. The GTE field of study also includes onshore and offshore exploration. In accommodating these requirements, the courses in the field have been enhanced to equip geotechnical engineers not only with traditional knowledge of soil mechanics and geology but also with skills in hydrogeology, geochemistry, biological processes, petroleum engineering, resource exploration, and geophysics. Students in the field are exposed to geomaterials, continuum mechanics and particulate/discontinuous media.

6.2 Research Facilities and Laboratories

The Geotechnical and Geoenvironmental Laboratory can be boasted as one of the most equipped geotechnical laboratories in the region with more than 30 years of experience in both soil and rock testing. The laboratory, which offer technical services on testing and research on the engineering behavior and properties of soil and rock; geologic mapping; environmental geophysical surveys; and testing of geosynthetic materials conducted by ACSIG, consists of five (5) sections - Soil Mechanics, Rock Mechanics, Engineering Geology, Geophysics, and Geoenvironmental Engineering.

Soil Mechanics Laboratory

The Soil Mechanics Laboratory has facilities for testing and research on the engineering behavior and fundamental properties of soil. It is equipped to test compaction, seepage, compressibility, deformation and shear strength, soil dynamics, and ground improvement.

Among other equipment, it has an automatic Central Data Acquisition System (CDAS) and two temperature-controlled rooms that house triaxial and consolidation equipment. Its field operation unit has a full range of tools for sampling soils and rocks and field test equipments for vane tests, Dutch cone tests, piezocone tests, pressuremeter tests, screw plate tests, electric logging, and vibration measurements.

Rock Mechanics Laboratory

The Rock Mechanics Laboratory has facilities to determine a variety of the physical and mechanical properties of rocks and rock aggregates required for research and practice.

Moreover, the laboratory is capable of determining hardness, swelling and slake durability index properties of weak rocks. The laboratory has provided testing services to a large number of infrastructure projects in the region.

Engineering Geology Laboratory

The Engineering Geology Laboratory has facilities for research on the engineering behavior and fundamental properties of rocks and minerals.

It provides classification and characterization tests for rock and minerals including petrographic and X-ray diffraction studies. It has stereoscopes, radial line planimetric plotter, stereo-sketch and sketch masters for analysis and interpretation of airphotos as applied to mineral explorations, transportation route studies, forestry, and civil engineering.

Geophysics Laboratory

The Geophysics Laboratory is being developed for training and researches in Geosystem Exploration and Petroleum Geoengineering. It has a number of seismic, electric, magnetic and radiometric instruments, including some of the most advanced equipment such as DAS-1 (OYO), a multipurpose hi-performance seismic data acquisition system, or SYSCAL R1 Plus (IRIS Instruments), an all-in-one multi-electrode resistivity and induced polarization (IP) imaging system.

The Laboratory is capable of conducting and assisting in geophysical field surveys for engineering, environmental, mineral resources, oil and gas exploration as well as in...
performing analysis, interpretation and visualization of geophysical data acquired.

**Geoenvironmental Laboratory**

The Geoenvironmental Laboratory provides a variety of equipment for geoenvironmental engineering research. It has equipment for geotechnical and chemical analysis that supports research in fundamental processes related to soil, water and chemical interactions that are applied to site and risk assessment, waste containment systems, and remedial technology. The chemical analysis equipment, spectrophotometer, from which the ion concentration can be determined with good accuracy and precision, enables research on soil-contaminant interaction.

Flexible wall permeameter, rigid wall permeameter and consolidation cell with permeameter are used to analyze water and chemical migration through waste containment systems. While the electrokinetic cell with advanced monitoring and controlled system is utilized for research in site reclamation and site remediation.

### 6.3 Faculty and Research Staff

#### Full-time Faculty

DENNES T BERGADO, BSCE, Mindanao State Univ, Philippines; MEng, AIT, Thailand; PhD, Utah State Univ, USA **Professor**

(Underground improvement techniques, Geosynthetic Engineering, Landfill Liners, In-situ Testing, and Geotechnical Engineering for Mitigation of Natural Hazards) [Ground improvement techniques and geosynthetics, In-situ testing, Geotechnical disaster mitigation, and Probabilistic/numerical methods in geotechnical engineering]

ULRICH GLAWE, Dipl-Geol, Univ of Erlangen-Nuremberg, Germany; MSc, Imperial College, UK; PhD, Univ of Erlangen-Nuremberg, Germany. **Associate Professor** (Geoenvironmental Engineering; Engineering Geology) [Geological hazards; Ground improvement using electrochemical stabilization; Contaminant transport in fine-grained soils; Landfill design for developing countries and in wet lands; Tsunami deposits]

NOPPADOL PHIEN-WEJ, BEng, Chulalongkorn Univ, Thailand; MS, PhD, Illinois at Urbana-Champaign, USA. **Associate Professor** (Tunnelling and other underground excavations in rocks and soils; Slope stability and retaining structures; Landslides; Earth structures and dams; Pile foundations; Buried pipes and culverts) [Soft ground tunnelling; Underground excavations in rock; Deep excavations; Land subsidence from deep well pumping; Rock properties]

KYUNG-HO PARK, BEng, MEng, Korea Univ; DEng, SUNY at Buffalo, USA. **Assistant Professor** (Geotechnical Engineering; Geomechanics; Computational Mechanics; Boundary Element Methods)

**Research Staff**

PHAM HUY GIAO, DEng, MEng, Asian Institute of Technology, Thailand; Dipl Ing (MSc), Bucharest University, Romania **Senior Research Engineer** (Exploration and Engineering Geophysics; Geotechnical Engineering; Computer-Aided Analysis in Geoengineering)

### 6.4 Grants and Sponsored Research

**Completed in 2007**

- **An Engineering Geophysical Study on Ground Penetration Radar (GPR) and Electric Imaging (EI)**
  - Responses to Detect of Voids beneath and/or inside a Concrete Pavement
  - Duration: 1-Sep-06 - 15-Dec-07
  - Project Investigator: Dr. Pham H. Giao
  - Sponsors: Bureau of Road Research and Development, Department of Highways, Thailand
  - Total Contracted Amount (Baht): 199,919

- **Application of Stiffened Deep Cement Mixed Column in Ground Improvement of Soft Bangkok Clay**
  - Duration: 1-Nov-05 - 31-Dec-07
  - Project Investigator: Prof Dennes T. Bergado
  - Sponsors: Royal Thai Government
  - Total Contracted Amount (Baht): 1,000,000

- **Thailand-Korea-Japan Symposium on Tunneling and Underground Space Technology for Urban Environment**
  - Duration: 19-Mar-07 - 31-Dec-07
  - Project Investigators: Dr. Khung-Ho Park and Dr. Noppadol Phien-wej
  - Sponsors: RTG-AIT, International Tunneling Assoc., Thailand, Institute of Underground Space Technology (Korea University), Korean Tunneling Association, participants
  - Total Contracted Amount (Baht): 500,000

### 6.5 On-going Grants and Sponsored Research

- **Building Human Resources in the Development of Academic**
Programs in Sustainable Geosystem Exploration and Engineering
Duration 1-Nov-05 - 30-Nov-08
Project Investigator Dr. Pham Huy Giao
Sponsors Asia Link / European Commission
Total Contracted Amount (Baht) 238,706

Construction Supervision for Mechanically Stabilized Earth of Bridge Approach Project
Duration 1-Oct-07 - 30-Sep-08
Project Investigator Prof Dennes Bergado
Sponsors Nawarat Pattakarn Public Co Ltd Thailand
Total Contracted Amount (Baht) 1,400,000

Geotechnical Study Hutgyi Hydropower Project (Additional Work)
Duration 1-Apr-06 - 30-June-08
Project Investigator Dr. Noppadol Phien-wej
Sponsors EGAT Public Company, Thailand
Total Contracted Amount (Baht) 1,416,680

Geotechnical Advice in Construction Supervision on Foundation and Tunnel, Kawenoi Dam Project
Duration 1-Mar-06 - 30-Mar-08
Project Investigator Dr. Noppadol Phien-wej
Sponsors P&C Management, Co., Ltd., Thailand
Total Contracted Amount (Baht) 321,000

Ground Deformations and effects on Adjacent Structures caused by Subway Tunneling in Bangkok
Duration 25-Apr-07 - 25-Apr-08
Project Investigator Kyung-Ho Park
Sponsors Royal Thai Government
Total Contracted Amount (Baht) 900,000

Initial Near-surface Geophysical Investigation of the Suvarnabhumi International Airport (SBIA)
Duration 1-Sept-07 - 30-Apr-08
Project Investigator Dr Pham Huy Giao
Sponsors IMMS Company Limited Thailand
Total Contracted Amount (Baht) 1,343,381

Research on the Damages on the North East Reef of Male, The Maldives
Duration 1-May-06 - 30-Apr-09
Project Investigator Dr. Ulrich Glawe/ Dr Khung Ho Park
Sponsors Environment Research Center Male, MV
Total Contracted Amount (Baht) 1,563,109

Safe and Sustainable Water Management of Municipal Solid Wastes in Bangladesh through the Practical Approach of WasteSafe Proposal
Duration 1-Jan-07 - 31-Dec-09
Project Investigator Dr Ulrich Glawe/ Dr Kyung-Ho Park
Sponsors European Commission
Total Contracted Amount (Baht) 3,731,684

6.6 Publications

Referred Journals

Referred Books/Chapters
Guest Editor, Special Issue on Tsunami Reconstruction with Geosynthetics Containment Systems, Geotextiles & Geomembranes Journal, Vol.25, No. 4-5, August- October 2007.

Conference Proceedings


Other Publications


Lecture Notes: EIT Workshop on Tunnel Construction Technics, Lopburi, Thailand, 26-27 July 2007.Tunnelling Technology and Design

Lecture Notes: Short Course on Rock Slope Engineering, Nakorn Ratsima, Thailand. 22-23 March, Design Criteria for Rock Slope Excavation and Rock Slope Stabilization in Civil Engineering Projects


Proceedings of Seafo-AIT-EIT
6.7 Masters Students’ Theses and Research Studies

A Study on Aquifer Storage Transfer and Recovery (ASTR) in a Fractured Aquifer, Khon Kaen, Thailand
By: Thamrongsak Suwanishwong
Supervisor: Dr. Pham Huy Giao

Application of Bentonite Slurry and Polymer-Based Slurry to Wet-Process Bored Piles Construction in Bangkok Multi-Layered Soil
By: Ong Chin Yee
Supervisor: Prof. Dennes T. Bergado

Application of the Ground Penetration Radar in Geotechnical Engineering
By: Wattana Maneechot
Supervisor: Dr. Pham Huy Giao

Application of the Magnetic Susceptibility Method in Geoengineering
By: Chatree Chumpoo
Supervisor: Dr. Pham Huy Giao

Boulder Transport Caused by the 1883 Krakatau Tsunami
By: Claudia Maxcia
Supervisor: Dr. Noppadol Phienwej

Effects of Incompetent Inclusion on Properties of Rockfills for Dam Construction
By: Moet Moet Lwin
Supervisor: Dr. Ulrich Glawe

Review and Analysis of Hanoi Land Subsidence Monitoring Data
By: Nguyen Ngoc Minh
Supervisor: Dr. Pham Huy Giao

Thermo-PVD Improvement of Soft Bangkok Clay: Microstructure Evaluation and Analysis of Consolidation Behaviour
By: Roque C. Alea, Jr.
Supervisor: Prof. Dennes T. Bergado
Chapter 7: SET – MECHATRONICS AND MICROELECTRONICS
FIELD OF STUDY

7.1 Introduction

Mechatronics

At present, most academic institutions and industries in the Asian region are only system integrators. Components are procured from more developed countries (e.g. computer numerically controlled machines, robots, and automated guided vehicles) and are integrated as a system (e.g. flexible manufacturing system). To support the growth of the region's economy, expertise not only as system integrators but also as builders of components of advanced technologies must be developed. The growing number of electronic devices and the strong interactions between mechanical and electronic parts no longer permit separate investigations of these components.

Mechatronics provides new insights through an integrated consideration of mechanics, electronics and information technology. The curriculum is designed to provide multidisciplinary knowledge and to develop the ability to design mechatronics systems.

Microelectronics

The region's growing industrial sector and the increasing demand for high technologies have brought the need for expertise in microelectronics to a critical level. The students are prepared to cope with the needs of the electronics industry in the region. The curriculum is equally balanced between the analog and digital design of circuits as well as the processing related topics including failure analysis, suitable for this electronics industrial sector in the region. The curriculum has been designed and constantly adapted in partnership with microelectronics industries and collaborating universities overseas. Miniaturisation of IC and the possibilities of completely new technologies like nanotechnology have also been introduced.

7.2 Research Facilities and Laboratories

Mechatronics and Microelectronics fields of study share all the laboratory facilities with IEM and DME fields of study. There are several well equipped laboratories with the primary function of supporting the students and faculty for teaching and research and to conduct outreach programs.

Mechatronics and Automation Laboratory

The Mechatronics and Automation laboratory is well equipped with many PLC systems (S5, S7200/300/400, INDRAMAT, BOSCH), distributed control systems (PCS7), operator panels (OP5, OP17/DP and OP35), a PC-based human machine interface package (WINCC) and networked field buses (PROFIBUS, INTER-BUS and SERCOS). The lab has mobile robots (NOMAD, PIONEER 2), robot arms (CRS), an industrial robot (KUKAKR15), a self-made open architecture CNC machine, CNC control systems (MTC200, SINUMERIK 8100/8400), image processing systems (DVIT, MATROX) and FPGA's (XILINX-1i VIRTEX PRO, ALTERA). Software such as SYNOPSYS IC Design, ANYSIM, ANSYS, ADAMS and many types of special sensors and actuators are also available for research use.

The Integrated Circuit Design laboratory gives students access to a wide variety of professional software applications including ANSYS, Orcad, ModelSim SE, Xilink ISE, Synopsys, Leonardo Spectrum LS and Tanner (S-Edit for Schematic Capture, T-Spice and W-Edit for Simulation and LEdit for Physical Layout). The laboratory's facilities are used for analog and digital circuit design, microchip design and fabrication, MEMS, microactuators and micro-sensors design, computational electronics, and so on. Fabrication facilities are available through the National Electronics Technology Center and the National Science and Technology Development Administration located in nearby Science Park.

Mechatronics faculty and students work in close collaboration with industry and government sectors in the areas of industrial automation, robotics, control, system design and integration. Some examples of ongoing projects include a medical tele-analyzer, automated visual inspection systems, MEMS design, an autonomous flying robot, automating centrifuge machines, an autonomous underwater robot and automating crystallization processes.

Simulation Laboratory

This lab is equipped with networks of Pentium PC for general applications and internet access, high end CAD/CAM & Simulation software such as ARENA and AutoMOD. In addition, a high performance computer facility with parallel cluster is also available for research use.
Microelectronics Laboratory

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(1) IC Design Lab
(2) Nanotechnology

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The Nanotechnology laboratory consists of a chemistry lab, an instrumentation room and an electronics laboratory. The chemistry laboratory is equipped with standard chemical tables and hoods for carrying out wetchemical processing. The instrumentation room consists of equipment such as optical spectrophotometers and microscopes. The electronics laboratory is equipped with digital oscilloscopes, signal generators, power supplies and standard meters, and it is stocked with a variety of discrete devices for testing and research.

Computer Integrated Manufacturing (CIM) Laboratory

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Metrology Laboratory

The Metrology laboratory also provides hardware and software support for Industrial Systems Engineering. The Metrology Laboratory is equipped with measuring instruments including Zeiss CMM, Mitutoyo Profile Projector and a Taylor Hobson surface roughness tester, as well as LabVIEW hardware and software.

7.3 Faculty and Research Staff

Full-time Faculty

NITIN V AFZULPURKAR, BEng, Univ of Poona, India; PhD, Univ of Canterbury, New Zealand Associate Professor
[Computer vision (pattern recognition and image processing); MEMS design, fabrication for electronic and bio medical applications; Soft computing algorithms for robotics and automation applications; Mechatronics applications for industrial use]

JOYDEEP DUTTA, BSc (Hons), St Edmund’s College; MSc (Physics), North Eastern Hill Univ; PhD, IACS, Calcutta Univ, India. Associate Professor [Functional materials, nanomaterials, Nanoparticles, selforganisation, Biomimetic processes, Polyelectrolyte deposition, Gas sensors, Biosensors, optoelectronic devices]

MANUKID PARNICHKUN, BEng, Chulalongkorn Univ, Thailand; MEng, PhD, Univ of Tokyo, Japan Associate Professor [Robotics, control, and measurement (involves with design and development of hardware and software of mechatronics devices); New robot mechanism, novel control algorithm, and innovative measurement concept are investigated]

Visiting Faculty

LERTSAK LEKAWAT, BE King Mongkut’s Institute of Technology Ladkrabang, Thailand; MSc., George
DENIS SWEATMAN, B.Sc.; Ph.D.,
the University of Queensland, Australia. Visiting Lecturer [Analog and Digital Devices, Circuits, Sensors and Optic Communications]

UDUPI SRIPATI, B.Eng.,
Mangalore University; M.Tech.; NITK Surathkal; and Ph.D., Indian Institute of Science. Visiting Senior Lecturer [Linear Ics and applications; antennas and propagation; advanced digital communications, signal detection and estimation, error control coding, information theory, transmission lines and wave-guides, RF circuit techniques]

7.4 Grants and Sponsored Research Completed in 2007

Automated Pick and Place of Concrete Roof Tile at the Pressing Machine Operation
Duration 1-Jan-06 - 31-Dec-07
Project Investigator Dr. Nitin Afzulpurkar
Sponsor CPAC Roof Tile Co. Ltd, Thailand
Total Contracted Amount (Baht) 1,350,000

Fabrication and Properties of Nanoparticles Array
Duration 11-Jan-06 - 31-Dec-07
Project Investigator Dr. Joydeep Dutta
Sponsor KIST
Total Contracted Amount (Baht) 1,150,000

Inline OCR Yield Improvement
Duration 1-Jan-07 – 30-Apr-07
Project Investigator Dr. Nitin Afzulpurkar
Sponsor Western Digital Co. Ltd., Thailand
Total Contracted Amount (Baht) 160,000

Nanotechnology-based Pressure Sensors for Tsunami Detection
Duration 1-Dec-05 – 31-Dec-07
Project Investigator Dr. Joydeep Dutta
Sponsor RTG Joint Research Project FY 2005
Total Contracted Amount (Baht) 875,000

7.5 On-going Grants and Sponsored Research

Automated Inline Foam Sheet Placement and Adhesion
Duration 1-Jun-07-31-May-08
Project Investigator Dr Nitin Afzulfukar
Parnichkun
Sponsor National Electronics and Computer Technology Center, Thailand
Total Contracted Amount (Baht) 1,500,000

Brain-Machine Interface for Robo-Animal Control Project
Duration 31-Jul-06 - 30-Jul-09
Project Investigator Dr. Manukid Parnichkun
Sponsor Thailand Research Fund
Total Contracted Amount (Baht) 1,200,000

Development of a Medical Tele-Analyzer by Force-Displacement-Hybrid Tactile Sensor and Actuator for Abdominal Mass Analysis (Phase 2) Project
Duration Aug-04 - Dec-08
Project Investigator Dr. Manukid Parnichkun
Sponsor NECTEC
Total Contracted Amount (Baht) 1,674,200

Development of an Automatic Steering Cruise Control System for Passenger Cars
Duration 1-Nov-07-31-Oct-10
Project Investigator Dr Manukid Parnichkun
Parnichkun
Sponsor National Electronics and Computer Technology Center, Thailand
Total Contracted Amount (Baht) 1,988,000

Development of an Exoskeleton Robot for Handicapped People Project
Duration 1-Jul-06 - 30-Jun-09
Project Investigator Dr. Manukid Parnichkun
Sponsor National Electronics and Computer Technology Center (NECTEC), Thailand
Total Contracted Amount (Baht) 2,043,100

Development of Generic Smart MEMS based Control System
Duration 2-Feb-04-30-Jun-08
Project Investigator Dr Nitin Afzulfukar
Sponsor National Electronic and Computer Technology Center, Thailand
Total Contracted Amount (Baht) 3,880,800

7.6 Publications

Refereed Books/Chapters


Refereed Journals


Conference Proceedings


7.7 Doctoral Students’ Dissertation

Development and Control of an Autonomous Flying Robot
By: Sukon Puntunan
Supervisor: Dr. Manukid Parnichkun

7.8 Masters Students’ Theses and Research Studies

MECHATRONICS

By: Phyu Phyu Sandar Htay
Supervisor: Dr. Nitin V. Afzulpurkar

Automatic Obstacle Recognition for a Mobile Robot
By: Thanan Rueankhong
Supervisor: Dr. Nitin V. Afzulpurkar

Control of a Rat by an External Stimulator
By: Bui Dinh Vuong
Supervisor: Dr. Manukid Parnichkun

Control of pH level by PLC in a Waste Water Treatment Plant
By: Ngo Viet Thang
Supervisor: Dr. Manukid Parnichkun

Design and Analysis of One DOF Haptic Device for Telerobotic Control
By: Le Xuan Huy
Supervisor: Dr. Nitin V. Afzulpurkar

Design and Control of a Leg Exoskeleton
By: Ngo Quang Hieu
Supervisor: Dr. Manukid Parnichkun

Design and Development of Jumping Mechanisms
By: Dian Artanto
Supervisor: Dr. Manukid Parnichkun

Design and Implementation of Cruise Control System in a Passenger Car
By: Saranakom Cheechoaron
Supervisor: Dr. Manukid Parnichkun

Design of an Automatic Transmission for a Bicycle
By: Nguyen Trong Thuong
Supervisor: Dr. Pisut Koomsap

Developing a Speech Recognition System for the Sinhala Language
By: Mudunkotuwage Sidath Pragnaratna
Supervisor: Dr. Matthew Dailey

Development of a Parallel Robot
By: Ly Tan Huy
Supervisor: Dr. Manukid Parnichkun

Development of a PLC Based Fuzzy Logic Process Control System using Profibus DP Asic Chip
By: Huynh Thanh Vu
Supervisor: Dr. Nitin V. Afzulpurkar

Development of a Rescue Robot
By: Doan Thanh Son
Supervisor: Dr. Manukid Parnichkun

Development of Soccer Robot using Vision and Potential Field Technique
By: Prashanta Man Shrestha
Supervisor: Dr. Manukid Parnichkun

Development of Vision Service in Robotics Studio for Road Sign Recognition and Control of Lego Mindstorms Robot
By: Pham Dinh Trung
Supervisor: Dr. Nitin V. Afzulpurkar

Fingerprint Identification
By: Dao Thi Phuong
Supervisor: Dr. Nitin V. Afzulpurkar

Formation Control of Multiple Mobile Robots using Vision Feedback
By: Muhammad Musharraf Nadeem
Supervisor: Dr. Manukid Parnichkun

GPS and Map Based Navigation System for an Intelligent Vehicle
By: Keeradit Angsutoranangsi
Supervisor: Dr. Manukid Parnichkun

New Approach for Hard Disk Drive Servo Control using Composite Nonlinear Feedback
Control and Compensator for Improving the Accuracy of Track Seeking and Track Following
By: Ngo Hoang Tung
Supervisor: Dr. Nitin V. Afzulpurkar

Path Planning for a Mobile Robot in a Dynamic Environment
By: Nguyen Truong Thanh
Supervisor: Dr. Nitin V. Afzulpurkar

Pick and Place Machine for Biscuit Production
By: Ruwan Manjula Weerasinghe
Supervisor: Dr. Nitin V. Afzulpurkar

Position Control of a Pneumatic System by Multimode PID-Sliding Mode Controller
By: Nguyen Tung Lam
Supervisor: Dr. Manukid Parnichkun

Remote Control of an Underwater Robot
By: Vu Minh Hung
Supervisor: Dr. Manukid Parnichkun

Road Tracking Control for an Intelligent Vehicle
By: Nguyen Le Minh Thu
Supervisor: Dr. Manukid Parnichkun

Robotic Spray Coating using Stereo Vision
By: Huynh Ng Tuankhiet
Supervisor: Dr. Nitin V. Afzulpurkar

Signal Recognition for a Brain Machine Interface
By: Dang Ngoc Anh
Supervisor: Dr. Manukid Parnichkun

Static and Dynamic Objects Recognition for an Intelligent Vehicle
By: Nguyen Chanh Nghiem
Supervisor: Dr. Manukid Parnichkun

System Identification of an Electrical Car for Steering and Speed Control
By: Chaityaporn Silawatchananai
Supervisor: Dr. Manukid Parnichkun

Theoretical Study and Design for Image Formation through Walls using a Distributed Radar Sensor Network Design
By: Theopharat Chueschoskant
Supervisor: Dr. Nitin V. Afzulpurkar

Towards Real-time Terrain Modeling for Robot Navigation using a Monocular Camera
By: Muhammad Tufail
Supervisor: Dr. Matthew Dailey

Traffic Sign Recognition System for Intelligent Vehicles
By: Doan Nguyen Huy Khoi
Supervisor: Dr. Manukid Parnichkun
Using the S60 Mobile Phone Platform for SCADA SQL Database Access and Process Control
By: Tran Dinh An
Supervisor: Dr. Nitin V. Afzulpurkar

MICROELECTRONICS

1 Volt Based Frequency Synthesizer Design for 2.4 GHz ISM Band
By: Md. Hasan
Supervisor: Dr. Lertsak Lekawat

Design of Low-power Temperature Sensor for Wireless Telemetry Using 0.35 Micrometer CMOS Technology
By: Tanipporn Rujiraapa
Supervisor: Dr. Lertsak Lekawat

Fabrication and Properties of Nanoparticles Array Project

Designing Ink Jet Printer for Microfabrication of Electronic Devices using Nanoparticles
By: Rungrot Kitsomboonloha
Supervisor: Dr. Nitin V. Afzulpurkar

Fabrication of Dye Sensitized Solar Cell (DSSC) Focusing on Improvement in Cell Performance
By: Naveed Ul Islam
Supervisor: Dr. Joydeep Dutta

Innovative Filtration Media for Particulate and VOC Reduction in Hard Disk Drives
By: Sunandan Baruah
Supervisor: Dr. Joydeep Dutta

Noise Reduction System for a Digital Hearing Aid
By: Wasit Limprasert
Supervisor: Dr. Lertsak Lekawat

Optimization and Authentication using XTEA for Low Power Hardware Encryption for Secure RFID
By: Kasorn Galajit
Supervisor: Dr. Nitin V. Afzulpurkar

Package Construction Analysis in Ultra Small IC Packaging
By: Rojalin Pradhan
Supervisor: Dr. Joydeep Dutta
8.1 Introduction

Geoinformatics comprising Remote Sensing (RS), Geographic Information System (GIS) and Global Positioning System (GPS) provides extremely useful tools for environmental and natural resources management. They are widely recognized as supporting tools for the planning, monitoring, and management of the appropriate utilization of resources at the country, regional and global levels. While they represent multidisciplinary backgrounds, students in RS&GIS share a common interest, that is, to use remote sensing, GIS, GPS and other space technologies as tools in pursuing their academic work as well as in developing new technologies that are applicable to the region. Because of the complexity of the technologies together with the heavy dependence on advanced computer skills, application specialists need to have a sound knowledge of the theoretical aspects and practical approaches to integrate many resources of information that address different applications.

Furthermore, scientists, planners or engineers interested in these technologies should be familiar with past, present and future satellite systems, their appropriate usage, data acquisition and handling and integration with other data sources. The curriculum well covers the theoretical aspects and application of space technology, especially in Remote Sensing and GIS. It provides students ample time to gain application know-how through laboratory sessions. Students are free to use satellite data received by the NOAA, AVHRR and MODIS Satellite Receiving Stations for their theses or research studies.

The demand for RS&GIS graduates is very high as there is lack of professionals in these disciplines, particularly those with a vast knowledge of the practical utilization of these technologies. Employment opportunities are available in a wide range of areas, including agriculture, forestry, coastal development and management, urban planning and development, medical technology, mapping and planning, disaster mitigation and environmental management.

Major areas covered in the coursework are fundamentals of remote sensing and GIS, earthenergy interaction, atmospheric correction, application potential in various disciplines, GIS data sources, map projection, geostatistics, spatial modeling, automated mapping, digital terrain model, GPS data acquisition, and integration of GIS, remote sensing and GPS.

8.2 Research Facilities and Laboratories

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, meeting rooms, and the Geoinformatics Center laboratory. The RS&GIS field of study has a policy of maintaining the best working environment for students, staff and faculty. Apart from the Institute-provided access to the Internet and electronic mail, each student of the RS&GIS field of study is allocated computer space for individual use of about 1-2 Gb (extendible). The space for personal web pages to be hosted on RS&GIS network, can also be provided upon request.

The RS&GIS LAN Network can also be monitored in real time. Besides, it has a very good 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, landuse, soil, geology maps of Thailand and some aerial photographs, are also available. The RS&GIS library also provides students with more specialized books, journals, and computer manuals. Some equipment in its laboratory available for academic activities include: Trimble ggeoexplorer; Garmin GPS Series III and V; laptop computer; digital camera; wireless hub/switch; wireless USB; network switch; network hub; black/white and color laser printers; A4 and A0 scanners; table and personal stereoscopes; and an LCD projector.

8.3 Faculty and Research Staff

Full-time Faculty

XIAOYONG CHEN, BS, MS, PhD, Wuhan Technical Univ of Survey and Mapping, People’s Republic of China. Associate Professor (Automated Mapping, GIS, Photogrammetry, Remote Sensing, Mathematical Morphology and Database Management System)

KIYOSHI HONDA, BAgri, DEng, Tokyo Univ, Japan Associate Professor (Image Processing, Erosion control, Terrain modeling)

NITIN KUMAR TRIPATHI, B Tech, National Institute of Technology, Warangal, India; M Tech, IIT; PhD, IIT, Kanpur,
Visiting Faculty

MICHIRO KUSANAGI, BS, MS, Univ of Tokyo, Japan; MS, Ph.D, Univ of California, USA.

SEISHIRO KIBE, BEng, MEng, DeG, University of Tokyo, Japan Visiting Professor (Aerospace System Engineering, Space System Engineering)

JUNICHI SUSAKI, BEng, MEng, DeG, Univ of Tokyo, Japan Visiting Assistant Professor (Environmental Information Extraction and Validation, Social Environmental Change detection, Automatic Pattern Recognition, Remote Sensing and GIS development)

Research Staff

MANZUL KUMAR HAZARIKA, PhD, University of Tokyo, Japan; MEng, Asian Institute of Technology, Bangkok, Thailand; MTech, Indian Institute of Technology, Kharagpur; B Tech, J N Krischi Vishwa Vidyalaya (J. N. Agriculture University), India Senior Research and Training Specialist (RS and GIS Applications to Global Environment, Terrestrial Carbon Cycle and NPP)

SURAT LERTLUM, BS, Norwich University; MS, The George Washington University, USA; DTechSc Computer Science, Asian Institute of Technology, Thailand Research Scientist (GIS, RS, Digital Image)

Applying Parallel Computing on Cluster and Grid Systems for Agricultural Monitoring Based on Crop Model and Remote Sensing
Duration 18-Oct-04-31-Jan-07
Project Investigator Dr. Honda Kiyoshi
Sponsor RTG Joint Research Project FY 2004
Total Contracted Amount (Baht) 970,000

Geoinformatics for Development
Duration 17-Mar-07-31-Dec-07
Project Investigator Dr. Ntin Kumar Tripathi
Sponsor Self-paid Participants
Total Contracted Amount (Baht) 246,370

Global Irrigation Mapping
Duration Dec-02 - Apr-07
Project Investigator Dr. Honda Kiyoshi
Sponsor International Water Management Institute
Total Contracted Amount (Baht) 1,825,031

International Conference on Health GIS
Duration 1-Oct-07-31-Jul-08
Project Investigator Dr Ntin Kumar Tripathi
Sponsor Self-paid

Japan Science and Technology 2006-2007
Duration 1-Apr-06 - 31-Mar-07
Project Investigator Dr. Lal Samarakoon
Sponsor Japan Science and Technology Agency
Total Contracted Amount (Baht) 831,750

JAXA Mini Project 2006-2007
Duration 1-Apr-06 - 1-May-07
Project Investigator Dr. Lal Samarakoon
Sponsor Japan Aerospace Exploration Agency
Total Contracted Amount (Baht) 12,308,800

New Technologies for Urban Safety of Mega Cities in Asia
Duration 1-Aug-06 - 31-Mar-07
Project Investigator Dr. Raktipong Sahamitmongkol
Sponsor JAXA
Total Contracted Amount (Baht) 950,000

Remote Sensing and GIS for Development
Duration 1-Feb-07-31-Dec-07
Project Investigator Dr. Ntin Kumar Tripathi
Sponsor Self-paid Participants
Total Contracted Amount (Baht) 438,000

Remote Sensing Images Analysis around the Mesopotamia Marsh
Duration Jan-04 - Jun-07
Project Investigator Dr. Honda Kiyoshi
Sponsor Digital Service international Co., Ltd. (DSI)
Total Contracted Amount (Baht) 1,092,530

Spatial Analysis of Malaria Risk to the Determination Epidemiological Surveillance in an Endemic Region of Thailand and the effectiveness of a New Control strategy
Duration 18-Oct-04-31-Jan-07
Project Investigator Dr. Honda Kiyoshi
Sponsor RTG Joint Research Project FY 2004
Total Contracted Amount (Baht) 1,000,000

Strengthening Capacity on Multi-Hazard Risk Assessment in Tsunami
Duration 15-Aug-06 - 1-Aug-07
Project Investigator Dr. Manzul Hazarika
Sponsor USAID
Total Contracted Amount (Baht) 3,604,702

The GIS Component in Tsunami Early Warning System of AIT
Duration Nov-05 - Apr-07
Project Investigator Dr. Honda Kiyoshi
Sponsor Royal Thai Government

8.4 Grants and Sponsored Research Completed in 2007

Processing, Surveying, Mapping)
LAL SAMARAKOON, PhD Visiting Senior Scientist; Director, ACRoRS and GAC (GIS, RS, Digital Image Processing, Surveying, Mapping)

MARC SOURIS, PhD, Université de La Rochelle, France Visiting Research Scientist (Remote Sensing and GIS development)

TARAVUDH TIPDECHO, BSc, MSc, Chiangmai Univ, Thailand; DTechSc, Remote Sensing & GIS, Asian Institute of Technology, Thailand Research Specialist I (Advanced Mapping, Terrestrial Scanning)

Total Contracted Amount (Baht) 360,000

Total Contracted Amount (Baht) 3,604,702

The GIS Component in Tsunami Early Warning System of AIT
8.5 On-going Grants and Sponsored Research

An Innovative Capacity Development Program for Extreme Flood Risk Assessment
Duration: 1-Oct-07-30-Apr-08
Project Investigator: Dr. Lal Samarackoon
Sponsor: United Nations University (UNU)
Total Contracted Amount (Baht): 2,040,000

Business and Logistics Management using Integrated RFID and InternetGIS
Duration: 1-Aug-07-01-Nov-08
Project Investigator: Dr Nitin Kumar Tripathi
Sponsor: RTG Joint Research Project FY 2005
Total Contracted Amount (Baht): 1,800,000

Spatial pattern of avian influenza in Thailand
Duration: 1-Mar-07-01-Jan-08
Project Investigator: Dr Marc Souris; Dr Nitin Kumar Tripathi
Sponsor:IRD France (ANR Ecoflu)
Total Contracted Amount (Baht): 1,418,150

UNIGIS Online Masters and Professional Program
Duration: 1-Aug-07-31-Jul-10
Project Investigator: Dr Nitin Kumar Tripathi
Sponsor: Self-paid Students
Total Contracted Amount (Baht): 1,089,000

8.6 Publications

Referred Journals


Conference Proceedings


8.7 Masters Students’ Theses and Research Studies

A GIS-Based Approach for Locating Suitable Sites for Cassava Plantation and Biofuel Industry
By: Naruemon Phongaksorn
Supervisor: Dr. Nitin K. Tripathi

**Directional Spectrum Analysis for Spatial Objects in 2D GIS**
By: Duan Minyan
Supervisor: Dr. Xiaoyong Chen

**Error Propagation Modeling in GIS Polygon Overlay**
By: Jinda Sae-Jung
Supervisor: Dr. Xiaoyong Chen

**GIS Application to Decision Making for Aquaculture Planning: A Case Study in Six Provinces of the Inland Mekong River Area, Vietnam**
By: Nguyen Xuan Trinh
Supervisor: Dr. Xiaoyong Chen

**GIS Based Application in Mobile Cellular Network: A Study of Microcell Propagation in Urban Areas**
By: Tran Minh Tri
Supervisor: Dr. Xiaoyong Chen

**GIS Based Earthquake Vulnerability Assessment: A Case Study of Lalitpur Sub-Metropolitan City, Nepal**
By: Diva Malla

Supervisor: Dr. Manzul Kumar Hazarika

**GIS - Based Planning for Sustainable Shrimp Farming: A Case Study in Thanh Phu, Ben Tre Province, Vietnam**
By: Nguyen Khac Thanh
Supervisor: Dr. Nitin K. Tripathi

**Integration of a Flood Simulation Model with GIS and Remote Sensing for Hazard Mapping in the Lower Mekong Subcatchment in Cambodia**
By: Arnob Bormudoi
Supervisor: Dr. Xiaoyong Chen

**Implementation of OpenGIS Sensor Observation Service for Remote Field Operation**
By: Aadit Shrestha
Supervisor: Dr. Kiyoshi Honda

**Mapping Forest Canopy Changes and Planning Afforestation: A Case Study of Siem Reap Province, Cambodia**
By: Heng Bauran
Supervisor: Dr. Nitin K. Tripathi

**Modeling Glacier Mass Balance by Comparing In Situ Measurements with Remote Sensing**
By: Niti Mishra
Supervisor: Dr. Kiyoshi Honda

Derived Parameters: A Study of Chhota Shigri Glacier, Western Himalaya, India
By: Niti Mishra
Supervisor: Dr. Kiyoshi Honda

**Monitoring of Forest Degradation at Near Real Time Using Multi-Temporal and Multi-Spatial Resolution Satellite Imagerys (Myanmar)**
By: Khun San Aung
Supervisor: Dr. Kiyoshi Honda

**Real Time Observation and Simulation of Soil Moisture using Agro-hydrological Model and Field Server**
By: Jagvijay Pratap Singh Gill
Supervisor: Dr. Kiyoshi Honda

**Ubiquitous GIS for Optical Fiber Cable Network Management at Ho Chi Minh City Posts and Telecommunications**
By: Dang Thi Phuong Dung
Supervisor: Dr. Kiyoshi Honda

**Use of Geospatial Technologies in the Assessment of Coral Reefs and Abalone Distribution in Sagay Marine Reserve, Central Philippines**
By: Armi May Mineza Torrechilla
Supervisor: Dr. Nitin K. Tripathi

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Capacity Building in Poverty Mapping in ASEAN Project
Chapter 9: SET – STRUCTURAL ENGINEERING FIELD OF STUDY

9.1 Introduction

Structural engineering has always been seen as one of the few fields of study where one can combine real technical skills with artistic flair. Structural engineers are known to be people who enjoy innovation, opportunities, responsibility and excitement, whilst working within a creative profession. Structural engineers plan and design various structures such as buildings, bridges, sport stadiums, towers, and underground structures.

The built environment which is designed and constructed by structural engineers has an enormous impact on our everyday lives. In order to design and construct safe and economic structures, they need to keep abreast with the latest methods of structural analysis, modeling concepts for computation, advanced design, material technology, and improved knowledge in structural loadings. The field educates professionals who will be at the forefront of advanced research in Structural Engineering. They are trained to respond creatively to the industrial requirements of infrastructure development.

9.2 Faculty and Research Staff

Full-time Faculty

WORSAK KANOK-NUKULCHAI, PhD, Univ of California (Berkeley), USA.; MEng, AIT, Thailand; BEng (Hon), Chulalongkorn Univ, Thailand. **Professor** [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]

PICHAI NIMITYONGSKUL, DEng, MEng, AIT, Thailand; BEng, Chulalongkorn Univ, Thailand. **Associate Professor** [Concrete Engineering; Building Design; Construction Materials; Prestressed Concrete Structures; Plate Structures; Advanced Reinforced Concrete; Advanced Concrete Technology; Materials and Products for Construction; Experimental Methods in Structural Engineering]

PENNUNG WARNITCHAI, DEng, MEng, University of Tokyo, Japan; BEng (Hon), Chulalongkorn Univ, Thailand. **Associate Professor** [Structural Dynamics; Earthquake Engineering; Wind Effects of Structures; Bridge Engineering and Control of Structural Vibration]

PIRIDHI KARASUDHI, PhD, Northwestern Univ., USA.; MEng, AIT, Thailand; BEng, Chulalongkorn Univ, Thailand. **Emeritus Professor** [Solid Mechanics]

THANAKORN PHEERAPHAN, PhD and MSc, Massachusetts Institute of Technology, USA., BSc., Virginia Military Institute, USA. **Adjunct Assistant Professor** [Concrete Technology; Structural Analysis; Engineering Materials; Composite Materials; Advanced Concrete Technology; Mechanics of Materials]

RAKTIPONG SAHAMITMONGKOL, DEng, MEng, University of Tokyo, Japan; BEng, Sirindhorn International Institute of Technology, Thailand. **Adjunct Instructor** [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]

PRUETTHA NANAKORN, DEng, University of Tokyo, Japan; MEng, AIT, Thailand; BEng (Hon), Chulalongkorn Univ, Thailand. **Adjunct Faculty** [Computational Mechanics; Finite Element Analysis; Meshless Methods; Structural Optimization]

NAVEED ANWAR, DEng, MEng, AIT, Thailand; BScEng., Univ. of Engineering & Tech., Lahore, Pakistan. **Affiliated Faculty** [Structural Analysis and Design; Computational Mechanics; Computer (Non-Destructive Test) and modeling of diffusion of substances in concrete]
9.4 On-going Grants and Sponsored Research

Adjustment to the Building Energy Code
Duration 1-Jan-01-31-Dec-08
Project Investigator Prof Worsak Kanok-Nukulchai
Sponsor Dansk Energi Management A/S, Denmark
Total Contracted Amount (Baht) 14,040,001

Application of the state of the art seismic design and modeling to major dam in Southeast Asia
Duration 1-Apr-07-30-Apr-09
Project Investigator Dr Pennung Warnitchai, Dr Noppadol Phien-wej, Dr Kyung Ho Park
Sponsor Royal Thai Government, K-Water, Dodam E&C
Total Contracted Amount (Baht) 2,000,000

Development of Precast Concrete Frame Buildings for Seismic Regions
Duration 20-Aug-07-19-Aug-08
Project Investigator Dr Pennung Warnitchai
Sponsor National Housing Authority, Thailand
Total Contracted Amount (Baht) 3,090,000

Development of Seismic Design Code for Buildings and Structures in Thailand
Duration 19-Sep-07-01-Mar-09
Project Investigator Dr Pennung Warnitchai
Sponsor Sirindhorn Institute of Technology (SIIT), Thailand
Total Contracted Amount (Baht) 2,380,000

Finite Element Modeling of Tsunami Propagation on the Coast of Thailand
Duration 1-Nov-05-31-Oct-08
Project Investigator Prof Worsak Kanok-Nukulchai
Sponsor RTG Joint Research Project FY 2005
Total Contracted Amount (Baht) 875,000

9.5 Publications

Refereed Journals

T. Vacharasintopchai, W. Barry, V. Wuwongse, and W. KANOKNUKULCHAI, Semantic Web Services Framework for


Other Publications


9.6 Doctoral Students’ Dissertation

A Meshless Analysis for Shell Structures Based on Moving Kriging Interpolation
By: Vilaysak Sayakoummane
Supervisor: Prof. Worsak Kanok-Nukulchai

A Quasi-Conforming Shell Element for Geometric and Material Nonlinearity
By: Gilson Rescober Lomboy
Supervisor: Prof. Worsak Kanok-Nukulchai / Dr. Kidu Kim

A Structural Engineering Support System Using Semantic Computing
By: Thiti Vacharasintopchai
Supervisor: Prof. Vilas Wwuongse/Prof. Worsak Kanok-Nukulchai

Fire Resistance of Ferrocement
By: Mr. Watwong Greepala
Supervisor: Dr. Pichai Nimityongskul

9.7 Masters Students’ Theses and Research Studies

A Survey of Configuration Irregularities in Typical Multi-story Concrete Buildings in Thailand
By: Chaiyapat Susuttajit
Supervisor: Dr. Pennung Warnitchai

Aerodynamic Interference Effects of Neighbouring Buildings on the Characteristics of Wind Forces on Tall Buildings
By: Thapana Thanatsang
Supervisor: Dr. Pennung Warnitchai

Creep and Shrinkage of High Strength and Durable Concrete Containing High Volume Fly Ash
By: Samrerng Thongton
Supervisor: Dr. Pichai Nimityongskul

Detection of Rebar’s Corrosion by Ultrasonic Wave
By: Anawat Cholesuwan
Supervisor: Dr. Yoshitaka Kato

Development of Hybrid Ferrocement I-Beams
By: Mongkol Eamkijkarn
Supervisor: Dr. Pichai Nimityongskul

Development of Steel Bomb Basket
By: Chat Thampanich
Supervisor: Dr. Pichai Nimityongskul

Effects of Beam-Column Joint Damage on Inelastic Seismic Responses of RC Frame Buildings
By: Sarawut Rungrattanaubon
Supervisor: Dr. Pennung Warnitchai

Estimation of Dielectric Property of Concrete and Determination of Reinforcements Size by Radar Method
By: Direk Kruaysrirong
Supervisor: Dr. Yoshitaka Kato

Feasibility Study of Using Natural Pozzolans from Democratic People’s Republic of Lao as Partial Replacement of Cement in Roller Compacted Concrete
By: Mandar Jadhav
Supervisor: Prof. Worsak Kanok-Nukulchai

Finite Element Analysis of Repaired Reinforced Concrete Beams
By: Porntep Phoothong
Supervisor: Dr. Pichai Nimityongskul

Influence of Pozzolans on Mechanical Properties of Cement Column
By: Hussain Lirar
Supervisor: Dr. Pichai Nimityongskul

Nonlinear Modeling of Gravity Load Designed Reinforced Concrete Buildings for Seismic Performance Evaluation
By: Matrin Suthasit
Supervisor: Dr. Pennung Warnitchai

Repair of Concrete Cracks Using Stitching Technique
By: Le Quoc Khanh
Supervisor: Dr. Pichai Nimityongskul

Seismic Retrofitting of Low-Rise Nonductile Reinforced Concrete Buildings by Buckling-Restrained Braces
By: Ekkachai Yooprasertchai
Supervisor: Dr. Pennung Warnitchai

Structural Behavior of Repaired Reinforced Concrete Beams
By: Siam Suwathanangkul
Supervisor: Dr. Yoshitaka Kato

Technical Feasibility of Baling Vetiver Grass (Vetiveria Zizanioides Nash) for Use as Load-Bearing Walls
By: Cory Michael Vitt
Supervisor: Dr. Pichai Nimityongskul
Chapter 10: SET – TELECOMMUNICATIONS FIELD OF STUDY

10.1 Introduction

The Telecommunications program offers areas of specialization in transmission systems; switching systems; telecommunications software development, and administrative and financial aspects of telecommunications management. The courses offered emphasize modern telecommunications skills in systems planning and design, as well as new services in ISDN and broadband telecommunication networks.

Graduates from the master’s program form the nucleus for effective high-level technical planning and management operations at their employer organizations. Some of the graduates are engaged in planning, development, and service activities leading to the installation, commissioning, management, design, etc., of value-added systems. Given the important role of our graduates in the development of the telecommunications sector, the learning is of significant benefit to the users of telecommunications services within the region. Graduates of the doctoral program play key roles in enhancing the level of education and research in the national universities of the region, and promote and strengthen the R&D potential of emerging regional manufacturing industries. Research covers a wide variety of topics at the cutting edge of research and development. Specific issues addressed in the broad fields of transmission and switching systems are, for example, coherent optical communications, multipleaccess strategies for cellarmobile and cabled networks, as well as questions of congestion control and new services in ISDN and future B-ISDN networks.

10.2 Research Facilities and Laboratories

Today’s fast-booming world of telecommunications and Computer networking plays a significant leadership role. To support this achievement the Telecommunications field of study puts the effort to continue the development of telecommunications technologies and systems. It covers a wide variety of research in telecommunications ranging from modeling, analysis wire line and wireless systems to application and protocol development. Its research subjects are in coherent optical communications; congestion control, ATM, and B-ISDN networks; error correction and detection methods; mobile and Internet traffic studies; multipleaccess strategies for cellarmobile, satellite systems, and cabled networks; network performance analysis, planning and design; and speech processing. Its research specialisations are in broadband networks; network planning; switching systems; telecommunications management in collaboration with the School of Management; telematics; and transmission systems.

Transmission and Switching Lab (TSL)

The Transmission and Switching Lab is equipped with Nokia Digital Switching Exchange DX200 (DX220, DX210) that supports PSTN and ISDN. There are also several telephone switches, traffic simulators, protocol analyzer, PDH/SDH (STM1 & STM4) transmission systems, fiber optic line equipment, transmission line analyzer, error rate meter which are available for experiment in switching, transmission and internetworking. The switching and transmission systems are integrated as real telecommunications network. Among the applications whose study has been made possible by these systems are Operation and Maintenance, performance measurements of real narrowband and broadband telecommunication networks, as well as new services.

Network Planning Lab (NPL)

High performance computer aided network planning tools are supported by several workstations at the Network Planning lab. This lab provides hands-on experience design and optimization in radio network, fixed network and fiber optical network.

Wireless Lab (WL)

The main purpose of the Wireless laboratory is for measurement and performance analysis. It is equipped with Modulation and Error rate measurement meters, Simulation software like SATSIM, which was developed by the students, is a simulation package to calculate the subsatellite points of a LEO/ MEO/ GEO and its orbital parameters. It also displays graphically on a twodimensional earth map the instantaneous position and path traced by the satellite (Multi orbit and Multi satellite). Another is NMS/ X, is a measurement system for GSM, DCS and NMT networks tracing, capable of measuring up to four networks simultaneously. The results are used for benchmarking service quality of operational cellular networks. These results can be analyzed and can be used for tuning the network parameters in NPS/X.

Communications Labs (CL)

The Communications lab is used to perform experiments courses under Signal and Systems,
Communications Electronics, Digital Transmission Technology and Digital Signal Processing. Test bench equipment includes analog and digital oscilloscopes, function generators, analog and digital Spectrum analyzers, Digital sampling oscilloscopes and DSP cards and workstations which have simulation applications like MATLAB.

**Computer Laboratory (PCL)**

There are two Computer Laboratories in Telecommunications Program. One is for Senior students and one is for Junior Students. All computers are latest powerful computers.

**TC Library**

In Telecommunications Program, there is a small library, from where students can borrow telecommunication related journals, manuals and reference books.

10.3 Faculty and Research Staff

**Full-time Faculty**

KAZI MOHIMUDDIN AHMED, MSc, Inst of Communications, Leningrad, USSR; PhD, Univ of Newcastle, Australia. **Professor** *(Telecommunication Networks; Digital Modulation Techniques; Satellite Communications; Cellular Mobile Communications; Digital Transmission and Communications)*

R M A P RAJATEVA, BSc, Moratuwa Univ, Sri Lanka; MSc, PhD, Univ of Manitoba, Canada. **Associate Professor** *(Equalization Algorithms for Frequency Selective Channels)*

**Visiting Faculty**

A B SHARMA, BSc, Univ of Newcastle-upon Tyne, UK; LicTech, DTech, Helsinki Univ of Tech, Finland. **Visiting Professor** *(Fiber-Optic Systems; Digital Transmission Technologies; Signals and Systems; Modulation Techniques; Coding Theory)*

TAPIO J ERKE, MSc, Helsinki Univ of Tech, Finland. **Visiting Associate Professor** *(Traffic measurements, modeling, and performance in various telecommunication networks, PSTN, Cellular, Internet, ATM, and optical networks; Resource allocation for different services, network dimensioning and optimization, and switching structures)*

10.4 Grants and Sponsored Research Completed in 2007

Training in RF Planning and Optimization for Cellular Networks

Duration 22-Jan-07-26-Apr-07

Project Investigator Dr Poompat Saengudomlert

Sponsor True Corporation, Thailand

Total Contracted Amount (Baht) 315,650

Training in RF Planning and Optimization for Cellular Networks-DTAC

Duration 18-Jul-07-14-Sep-07

Project Investigator Dr Teerapat Sanguankotchakorn

Sponsor Total Access Communications Plc (DTAC), Thailand

Total Contracted Amount (Baht) 379,850

10.5 On-going Grants and Sponsored Research

AIT Nokia Workshop on Mobile Internet and Applications

Duration 7-Dec-07-30-Jun-08

Project Investigator Dr Nandana Rajatheva

Sponsor Nokia Corporation, Finland

Total Contracted Amount (Baht) 500,000

Professional Masters in Telecommunications

Duration 23-Jul-07-20-Dec-08

Project Investigator Dr R M A P Rajatheva, Prof Kazi Ahmed, Dr Tapio Erke, Dr Teerapat Sanguankotchakorn, Dr Mikko Kovalainen, Dr Poompat Saengudomlert

Sponsor EVN Telecom, Vietnam

Total Contracted Amount (Baht) 8,534,000

10.6 Publications

Conference Proceedings

A. Hossain and P. Saengudomlert, "Beamforming using tap delay line filters for broadband CDMA systems,“


Atapattu, Saman; Rajatheva, Nandana, "Exact SER of Alamouti code transmission through amplify-forward cooperative relay over Nakagami-m fading channels", Communications and Information Technologies, 2007, ISCI’07, International Symposium on, 17-19 October 2007, Page(s): 1429-1433.


Saman Atapattu and Nandana Rajatheva, "Performance Evaluation of Alamouti STC through Amplify-Forward Cooperative Relay Network over Nakagami-m Fading Channels", International Workshop on Cooperative Wireless Communications and Networking (CoNET-07) held in Jeju Island, Korea from 6th to 8th December 2007. (website: http://home.simula.no/yanzhang/CoNET07/)


P. Dharmawansa, R.M.A.P. Rajatheva, C. Tellambura, “Envelope and phase Distributions of Two Correlated Gaussian Variables”, accepted for publication in IEEE Transactions on Communications 07 December 2007


Refereed Journals


Page(s):1407 – 1416


Refereed Books/ Chapter


“Quality of Service (QoS) in Telecommunication Networks” in Thai Telecommunications Encyclopedia 2007, Teerapat Sanguankotchakorn.

Other Publications

National Conference on Information Technology: Present Practices and Challenges, Delhi, India, August 31-2007- Invited Talk

10.2 Doctoral Students’ Dissertation

Design of DWDM Networks for Power Utilities

By: Areyaya Sriperch
Supervisor: Dr. Poompat Saengudomlert

10.3 Masters Students’ Theses and Research Studies

A Network Link Dimensioning Model for Aggregated Traffic in Differentiated Services IP-based Networks
By: Vo Minh Thanh
Supervisor: Assoc. Prof. Tapio J. Erke

Antenna Processing Applied to SIMO/OFDM Systems at the Receiver for PMR Applications: Uplink transmission (MS-BTS) Case
By: Folly Ayivi-Amah
Supervisor: Prof. Kazi Mohiuddin Ahmed

Bit-Interleaved Space-Time Coded Modulation with Iterative Decoding over Correlated Fading Channels
By: Iqbal Shahid
Supervisor: Dr. R.M.A.P. Rajatheva

Capacity and Performance Analysis of Space-time Block coded MIMO-OFDM Systems in Rician Fading
By: Imran Khan
Supervisor: Dr. R.M.A.P. Rajatheva

Design of LDPC based DVC Codec for a Noisy Channel
By: Satya Krishna Joshi
Supervisor: Dr. R.M.A.P. Rajatheva

Distributed Video Coding and Transmission over MIMO Wireless Channel
By: Thambu Kuganeswaran
Supervisor: Dr. R.M.A.P. Rajatheva

Dynamic Resource Allocation for WiMAX Systems
By: Nguyen Chi Quang
Supervisor: Dr. Poompat Saengudomlert

Performance Analysis of an LDPC-Space Time Block Coded MB-OFDM UWB System over a Log Normal Fading Channel
By: Jawaad Ullah Khan
Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Cooperative Communications Network with TDMA-Based Protocols
By: A.M.S.U.B. Atapattu
Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of OFDM Systems with Random Residual Frequency Offset
By: Pradeep Chathuranga Weeraddana
Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Space-Time Block Coded MIMO-OFDM Multiband UWB Systems over Nakagami Fading Channel
By: Junaid Ali Qureshi
Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Wireless Indoor OCDMA Transmissions Using Multi-PPM
By: Suradash Chungpaiboonpatana
Supervisor: Dr. Poompat Saengudomlert

Performance Evaluation of a FON Network
By: Asheralieva Alia Esenjanovna
Supervisor: Assoc. Prof. Tapio J. Erke

Speed Adjustment Algorithm for Mobile RFID Readers Performing Dynamic Framed Slotted Aloha
By: Laurent Simon
Supervisor: Dr. Poompat Saengudomlert

Research Study: Application of Low-Density Parity Check Codes to Data Storage Systems
By: Ratna Bahadur Budhathoki
Supervisor: Dr. R.M.A.P. Rajatheva

Research Study: Performance Analysis of 3G and WiMAX as Cellular Mobile Technologies
By: Sadia Murawwat
Supervisor: Prof. Kazi Mohiuddin Ahmed

Research Study: Performance Comparison of RFID Tag Anti-Collision Algorithm using Simulation and Real Testing Based on ISO 15693
By: Md.Razu Ahmed
Supervisor: Dr. Poompat Saengudomlert

By: Nguyen Thai Son
Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Performance of Single Carrier Modulation for an Integrated System Between Power Line and White-LED Communications
By: Raveewan Faninkaew
Supervisor: Dr. Poompat Saengudomlert

Research Study: Performance Study of Integrated Power Line and Optical Wireless Communications
By: Weerapong Ujarean
Supervisor: Dr. Poompat Saengudomlert

Research Study: Push-to-Talk over Cellular and Modelling of PTT Traffic
By: Mickael Glaud
Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Study of IP Traffic Monitoring Technologies
By: Emmanuel Giraud
Supervisor: Assoc. Prof. Tapio J. Erke

By: Nguyen Huu Nghi
Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Traffic Measurement and Analysis of Fixed Telephone Network in Rural Area: A Case Study of Tra Vinh Province, Vietnam
By: Bui Quoc Trung
Supervisor: Assoc. Prof. Tapio J. Erke
11.1 Introduction

Industrialization and population growth have tremendous impacts in the movement of people and goods. Everyday, movement is hampered by congestion, insufficiency of public transport facilities, traffic accidents, and other conditions. Moreover, as manufacturing expands globally, businesses want to reduce transportation costs by limiting the number of distribution nodes. Concerns over congestion on highways, increasing pollution and hazardous materials all emphasize the need to effectively maximize transportation systems. Thus, the issue of transportation is obviously crucial, not only now but in the future.

The Transportation Engineering field exposes students to the process of alleviating transportation problems. The coursework and research in the area provide advanced knowledge in transportation planning and economics, traffic engineering and safety, and the design of highways/pavements and other transportation facilities. Transportation Engineering students acquire advanced skills concerning the planning, design, operations, maintenance, rehabilitation, performance, and evaluation of transportation systems, including their economic and public policy aspects. The field imbibes in each student the development of analytic, problem-solving, design, and management skills suitable for public and private sector professional work.

11.2 Faculty and Research Staff

Full-time Faculty

JOHN HUGH JONES, B.S., B.Eng.,
University of California, USA
Emeritus Professor (Highway Engineering, Transportation Engineering)

SHINYA HANAOKA, D Info Sc, M Info Sc, BEng, Tohoku University; Japan. Assistant Professor (Transport planning and logistics; air transport, which includes evaluation of the air traffic distribution policies in multiple-airport region and the activity of low-cost carriers in Asia; transport logistics, which includes city logistics, intermodal logistics, maritime transport, air cargo and so on; Public transport market and the environmental impact of transport, such as air pollution and noise)

KUNNAWEE KANITPONG, PhD, University of Wisconsin-Madison; MS, University of Maryland at College Park, USA; BS, Chulalongkorn University, Thailand. Assistant Professor [Highway pavements with emphasis on several major aspects including: highway materials and construction, pavement design and analysis, pavement management system, asphalt rheology, and asphalt concrete mixture design]

Adjunct Faculty


PRAPANSAK BURANAPRAPA, PhD, Oklahoma State University, USA, M. Eng., SEATO Graduate School of Engineering; B. Eng., Chulalongkorn University; Thailand. Adjunct Associate Professor (Road and Pavement Design; Highway and Pavement Engineering)

Research Staff

ANJALI KUMARI, M. Sc, B. Sc, University of Bihar, India. Research Assistant (Logistic Management Project)

KRITSDA TANGKAVACHIRANON, D. Eng., M. Eng., Traffic Engineering, Asian Institute of Technology, Thailand; B. Eng. (Civil Engineering), King Mongkut’s Institute of Technology Thonburi, Thailand. Assistant Manager (TARC Project)

MOINUL HOSSAIN, M. Eng. (Transportation Engineering), Asian Institute of Technology, Thailand; B.Sc. Eng. (Civil). Bangladesh University of Engineering & Technology, Dhaka, Bangladesh. Research Associate (TARC Project)

MOUYID BIN ISLAM, M. Eng. (Transportation Engineering), Asian Institute of Technology, Thailand; B.Sc Eng. (Civil). Bangladesh University of Engineering & Technology, Dhaka, Bangladesh. Research Associate (TARC Project)

NUTTAPONG BOONTOB, M. Eng (Transportation Engineering), Asian Institute of Technology, Thailand. Research Associate (TARC Project)
11.3 Grants and Sponsored Research

11.4 On-going Grants and Sponsored Research

11.5 Publications

Referred Journals


Refereed Books / Chapters


Conference Proceedings


Islam, M.B. and Kanitpong, K., “An In-Depth Study of Road Crashes in Thailand,” the 14th International Conference on Road Safety in Four Continents, Bangkok, Thailand, November 2007


Other Publications


11.6 Doctoral Students’ Dissertation

Evaluation of Logistics Performance for Intermodal Transportation: A Fuzzy-Based Approach
By: Pichet Kunadhamraks
Supervisor: Dr. Shinya Hanaoka

Market Structure of Passenger Vans for Commuters in Bangkok
By: Supaporn Kaewko Leopairojna
Supervisor: Dr. Shinya Hanaoka

11.7 Masters Students’ Theses and Research Studies

Assessment of Warm Mix Asphalt Application in Thailand
By: Ma. Bernadeth Borleio
Supervisor: Dr. Kunnawee Kanitpong

Calibration of a Car-Following Model for Use in Bangkok
By: Chanida Anurakamolkul
Supervisor: Dr. Kunnawee Kanitpong

Injury Mechanism in Road Crash through Accident Investigation
By: Pakorn Aniwattakulchai
Supervisor: Dr. Kunnawee Kanitpong

Input Output Analysis for Transportation Economy and Logistics in Thailand
By: Hideo Fukushi
Supervisor: Dr. Shinya Hanaoka

Laboratory Study on Functional and Performance-Based Properties of Porous Asphalt Mix in Thailand
By: Somyonk Untama
Supervisor: Dr. Kunnawee Kanitpong

Life Cycle Cost Analysis of Polymer Modified Asphalt Pavement in Thailand
By: Soe Soe Win
Supervisor: Dr. Kunnawee Kanitpong
Optimization Model for Hazardous Material Transport Routing
By: Rojee Pradhananga
Supervisor: Dr. Shinya Hanaoka

Thailand Accident Research Center Field Visit
Chapter 12: SET – WATER ENGINEERING AND MANAGEMENT FIELD OF STUDY

12.1 Introduction

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 imparts education and training toward an understanding of the complexity of water cycle utilization and management. It offers a balanced curriculum, covering both engineering and management aspects of water resources. Students are trained to acquire knowledge and hands-on practice in tools and techniques to come up with viable and sustainable solutions within the framework of the integrated water resources management at the river basin scale.

The WEM field of study covers five focal areas: Agricultural Water, Coastal Water, Urban Water, Water Resources, and Extreme Events and Risk Management. The courses are designed in such a way that students can specialize according to their interests. Courses on Watershed Hydrology, Hydrodynamics, Water Resources Systems, and Concepts in Water Modeling provide the solid foundation to the advanced courses. The curriculum emphasizes tools and techniques in water resources planning and management.

Agricultural Water courses impart knowledge and skills necessary for the development and management of water resources for agriculture. They address various multi-disciplinary issues in the planning, design, implementation, operation and maintenance of irrigation and drainage projects and land and water conservation programs. Current researches in the area include irrigation and drainage system management, cropping systems, erosion and water quality problems, soil conservation and land-use, and watershed management. The management and design of sound engineering works for the control and effective use of coastal zones require in-depth knowledge of hydrodynamics and the understanding of coastal zone phenomena. Coursework and research in Coastal Water cover studies ofwave characteristics and their action on beaches, coastal sedimentation, estuarine hydraulics and the applied aspects of coastal zone engineering and management.

Urban Water courses relate to water supply and sanitation, storm water, and domestic wastewater and urban drainage for sustainable management of urban areas. The research in relation to urban water focuses on application of state-of-the-art theory in water demand forecasting and management, design and management of water distribution systems in urban and rural areas, real-time hydrological information systems for urban flooding and drainage. Given the ever-growing importance of water quality, an integrated water quantity-quality approach is essential. Courses in Water Resources focus on techniques to assess the occurrence and availability of surface and groundwater. Students acquire a sound understanding of basic principles in river engineering and modeling, water resources planning, conjunctive use of surface and groundwater; integrated water resources management and social and environmental impact assessment of water resources projects. In-depth knowledge and hands-on practice on mathematical modeling of water resources systems is provided. Flooding is a natural phenomenon and various human activities as well as climatic changes have aggravated the problem causing economic losses. Students are exposed to an understanding of the behavior of rivers, and to design appropriate structural and non-structural alternatives for the effective management of rivers and waterways. Research in the area of Extreme Events and Risk Management includes river flow analysis, and flood control and mitigation, flood modeling and forecasting, flood plain development and management.

12.2 Faculty and Research Staff

Full-time Faculty

ASHIM DAS GUPTA, BEng, Gauhati Univ, India; MEng, DEng, AIT, Thailand. Professor (Integrated Water Resources Management; Groundwater Development and management; Modeling and monitoring)

TAWATCHAI TINGSANCHALI, BEng, Chulalongkorn Univ, Thailand; MEng, DEng, AIT, Thailand. Professor [Flood Control Engineering and Management; Flood Forecasting, Warning and Flood Disaster Management; River Engineering and Hydropower; Water Resources Project System Optimization]

MUKAND S BABE, BEng, Rajasthan Agr Univ, India; MEng, DEng, AIT. Associate Professor [From hydrologic and water resources modeling to integrated water resources management; particularly in watershed modeling and management; drought analysis, forecasting and management; water resources allocation and management at river basin level; and water resources and socio-economic development; Research related to groundwater resources management and water supply]
system and management]

ROBERTO CLEMENTE, BSAE, Univ of the Philippines at Los Baños; MSc, AIT, Thailand; PhD, McGill Univ, Canada. Associate Professor [Focal areas related to irrigation/ drainage, and land and water resource assessment and management; Studies on the impacts of fertilization on water quality, modeling surface/subsurface transport of water and solutes, performance evaluation of irrigation and drainage systems, and assessment of soil erosion hazard and soil quality dynamics in agricultural watersheds; Joint research on water harvesting and management and soil hydraulic characterization in sloping agricultural lands; Future research focuses on evaluation and optimization of soil, water, chemical and crop management schemes to enhance agricultural productivity without jeopardizing environmental quality]

Visiting Faculty

HIROKAZU IKEDA, BEng, Dibrugarh Univ, India; MEng, AIT, Thailand; PhD, Univ of Tokyo, Japan. Visiting Associate Professor

Affiliated Faculty

SUTAT WEESAKUL, DEng, MEng, Asian Institute of Technology; BEng, Chulalongkorn University, Thailand [Numerical computation in sea and coastal area including flood propagation using developed computer programs; Application in solving urban drainage problem using both engineering and management approaches; By collaboration with Dr. Ole Mark from DHI, the on-line urban flood warning system at Sukumvit , Bangkok , Thailand providing useful information in daily life during rainy season are disseminated in http://www.wap.ait.ac.th; Improvement of hydraulic design using physical hydraulic model test in hydropower; hydropower development projects in Lao and Myanmar and improvement in design of intake, diversion tunnel, riparian outlet, energy dissipator, spillway and head pond]

12.3 Grants and Sponsored Research Completed in 2007

AIT Regional Network Office for Center of Excellence of University of Yamanashi
Duration 15-Jun-05-31-Dec-07
Project Investigator Prof Tawatchai Tingsanchali
Sponsor University of Yamanashi, Japan
Total Contracted Amount (Baht) 347,500

An ecological approach to water and sanitation assessment and management in Panglao Island , Philippines
Duration 1-Oct-06 - 31-Dec-07
Project Investigator Dr. Roberto S. Clemente
Sponsor SEA-UEMA / CIDA
Total Contracted Amount (Baht) 150,800

Development of Operational Flood Forecasting System Case Study: Chao Phraya River Basin
Duration 1-Jul-04 – 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor National Electronic and Computer Technology Center (NECTEC), Thailand
Total Contracted Amount (Baht) 5,027,400

Development of River Basin Flood Management System by Optimal Reservoir Operation and Real Time Flood Forecasting and Warning: A Case Study of Pasak River Basin
Duration 1-Aug-06 - 31-Dec-07
Project Investigator Prof. Tawatchai Tingsanchali
Sponsor National Research Council of Thailand
Total Contracted Amount (Baht) 2,000,000

Experimental Investigation of Hyper-concentrated Tsunami Run-Up
Duration 1-Nov-05- 30-June-07
Project Investigator Dr. Sutat Weesakul
Sponsor Royal Thai Government
Total Contracted Amount (Baht) 875,000

Hydraulic and Leakage

Investigation in Pipe Networks for Water Supply Distribution in Bangkok
Duration 28-Feb-05- 31-Dec-07
Project Investigator Prof. Tawatchai Tingsanchali
Sponsor ISONET Company Ltd.
Total Contracted Amount (Baht) 1,400,000

Hydraulic Model Study of Diversion Tunnel Nam Ngum 2 Hydroelectric Project
Duration 1-Sept-05 – 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor Team Consulting Engineering and Management Co., Ltd., Thailand
Total Contracted Amount (Baht) 3,132,193

Hydraulic Model Study on Overflow Spillway for Nam Ngum 2 Hydroelectric
Duration 1-Feb-06 - 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor Team Consulting Engineering and Management Co., Ltd., Thailand
Total Contracted Amount (Baht) 6,300,000

IGES Freshwater Resource Management Project
Duration 1-Sept-04- 30-Sept-07
Project Investigator Dr. Mukand S. Babel, Prof. Ashim Das Gupta (ret)
Sponsor Institute for Global Environmental Strategies (IGES), Japan
Total Contracted Amount (Baht) 462,500

MTERM International Conference
Duration 1-Jan-05 - 31-Dec-07
Project Investigator Dr. Mukand Singh Babel, Prof. Ashim Das Gupta
Sponsor Participants
Total Contracted Amount (Baht) 1,000,000

The 6th Research Meeting of the Research on Sustainable Water Management Policy
Duration 1-Feb-07-31-May-07
Project Investigator Dr. Mukand Singh Babel
Sponsor IGES, Japan
Total Contracted Amount (Baht) 352,990

The Study of Water Resources Management Review
Duration 1-Jan-06 – 31-Dec-07
Project Investigator Dr. Sutat Weesakul
Sponsor Hydro and Agro Informatics Institute (HAII)
Total Contracted Amount (Baht) 1,120,00

Workshop on Sediment Management in South and Southeast Asia
Duration 1-Apr-06 - 30-Jun-07
Project Investigator Dr. Mukand Singh Babel
Sponsor UNESCO, Paris
Total Contracted Amount (Baht) 874,000
12.4 On-going Grants and Sponsored Research

Asian Infrastructure Research Center (AIRC) Phase I Project Investigator Dr. Mukand Singh Babel, Dr Noppadol Phienwej, Dr Kyung Ho Park, Dr BHW Hadikusumo, Dr Kunnawee Kanitpong Sponsor Konkuk University, South Korea Total Contracted Amount (Baht) 4,472,153

Development of Flood Forecasting and Management System in Chao Phraya Tachin River Basins Project Investigator Dr Sutat Weesakul; Dr Noppadol Phien-wei Sponsor Royal Irrigation Department (RID) Total Contracted Amount (Baht) 17,769,706

E-learning Program on IWRM for self pay Student Duration 6-Sep-06-30-Aug-08 Project Investigator Dr. Mukand Singh Babel Sponsor Self Pay Students Total Contracted Amount (Baht) 190,000

E-learning Program on IWRM for UCC-Water Duration 1-Sep-06 - 3-Aug-08 Project Investigator Dr. Mukand Singh Babel Sponsor UCC-Water Total Contracted Amount (Baht) 1,242,500

Groundwater Quality Management Research in Bangkok Project Investigator Dr Mukhand S. Babel Sponsor Institute for Global Environmental Strategies, Japan Total Contracted Amount (Baht) 540,000

Regional Center of the UN Water Virtual Learning Center (WVLC) Project Duration 1-Nov-04-31-Dec-09 Project Investigator Dr. Mukand Singh Bavel, Prof Ashim Das Gupta Sponsor UNU-INWEH, Canada Total Contracted Amount (Baht) 2,346,000

Spillway Hydraulic Model Tests Nam Ngum 3 Hydropower Project Duration 1-Dec-07-30-Apr-08 Project Investigator Dr Sutat Weesakul Sponsor GMS Lao Company Ltd Total Contracted Amount (Baht) 4,800,000

Support to Capacity Building at the Water Resources University, Hanoi, Vietnam Project Investigator Dr. Mukand Singh Babel, Prof Ashim Das Gupta Sponsor Danish International Development Assistance (Danida) Total Contracted Amount (Baht) 3,801,000

Tha Chin River Basin Development Project: The King of Thailand’s Initiative Project Investigator Dr Sutat Weesakul Sponsor Royal Irrigation Department (RID), Thailand Total Contracted Amount (Baht) 17,388,570

UNEP Water Vulnerability Assessment in South and South East Asia Duration 1-Jan-06 - 30-Apr-08 Project Investigator Dr Mukhands S. Babel Sponsor UNEP ROAP Total Contracted Amount (Baht) 3,600,000

UNEP Water Vulnerability Assessment in South and South East Asia: Sub-regional synthesis for Africa-Asia Report Phase II Project Investigator Dr Mukhand S. Babel Sponsor UNEP RRC.AP Total Contracted Amount (Baht) 1,650,000

Verification of ATTA System with Laboratory Tsunami Waves Project Investigator Dr Sutat Weesakul Sponsor Royal Thai Government Total Contracted Amount (Baht) 1,000,000

12.5 Publications

Refereed Journals


Refereed Books / Chapters


Conference Proceedings


University of Yamanashi, Japan.


Peralta, G. and Clemente, R. 2007. Completion Report of the AIT-UPD joint project on Ecological approach to water sanitation and management: A case study of urban poor districts of Panglao island, Bohol, Philippines which was sponsored by CIDA through the JAR-SEA-UEAM program of AIT


12.6 Doctoral Students’ Dissertation

Improvements in Radar Rainfall Estimation for Hydrological Modeling
By: Thanaupon Piman
Supervisor: Dr. Mukand S. Babel

12.7 Masters Students’ Theses and Research Studies

Application of AnnAGNPS in a Selected Sub-basin of Ping Watershed for Soil and Water Quality Assessment
By: Sarayuth Punbune
Supervisor: Dr. Roberto S. Clemente

ANNUAL REPORT ON RESEARCH 2007
13.1. Introduction

Information and Communications Technologies 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.

13.2. Research Facilities and Laboratories

There is a rapidly growing and constantly evolving interest in ICT throughout the academia and society. To support this, the evolution and the benefits of ICT in our lives, the ICT field of study at AIT continues to research and develop ICT. The field of study covers a wide variety of research supported by the body of faculty consisting of a multi-professional team of international experts in telecommunication, computer science, educational technology and related fields.

The faculty has a strong academic background ranging from wireless and optical networks, through hardware and software, to web education and other e-services.

Research subjects include those on ICT applications (e-services such as e-learning, e-health, egovernance, rural development, knowledge creation and knowledge dissemination); on the information technologies (e.g. operating systems, programming languages, information storage and retrieval); on the communication infrastructure (e.g. networks, transmission technologies, switching and routing). Research specializations are in adaptive technologies; computer-supported collaboration; Home networking; ICT security; Online communities; and voice over IP.

The ICT area of study shares the research facilities and laboratories of the Telecommunications field of study.

13.3. Faculty and Research Staff

The ICT Field of Study draws from the faculty and research staff of the Computer Science, Information Management, Remote Sensing & Geographic Information Systems, and Telecommunications Fields of Study.

Faculty Members

From Telecommunications Field of Study

A B SHARMA BSc, Univ of Newcastleupon Tyne, UK; LicTech, DTech, Helsinki Univ of Tech, Finland.

KAZI MOHIUDDIN AHMED MSc, Inst of Communications, Leningrad, USSR; PhD, Univ of Newcastle, Australia. Professor

R M A P RAJATHEVA BSc, Moratuwa Univ, Sri Lanka; MSc, PhD, Univ of Manitoba, Canada. Associate Professor

TEERAPAT SANGUANKOTCHAKORN, BEng, Chulalongkorn Univ, Thailand; MEng, DEng, Tokyo Institute of Technology, Japan. Associate Professor

From ICT Field of Study

ERKE TAPIO, M.Eng., Helsinki University of Technology, Finland. Associate Professor

KURHILA JAAKO, Ph.D., M.Sc., Helsinki, Finland Assistant Professor

KOVALAINEN, MIKKO Ph.D., M.Econ., University of Jyväskylä, Finland Assistant Professor

From Computer Science and Information Management Field of Study

DUNG, PHAN MINH, Ph.D., M.Sc., University of Technology, Germany Professor

HADDAWY, PETER Ph.D., M.Sc., University of Illinois-Urbana Professor

KANCHANASUT, KANCHANA Ph.D., M.Sc., University of Melbourne Professor,

WUWONGSE, VILAS D.Eng., M.Eng., Tokyo Institute of Technology Professor

GUHA, SUMANTA, Ph.D., Indian Statistical Institute, M.Sc., Ph.D., University of Michigan, M.Sc., University of Calcutta
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13.4. Doctoral Students’ Dissertation

Analysis of Multivariate Generalized Gaussian Fading Distributions with Applications to Diversity Receivers
By: Kaluwa Devage Prathapasinghe Dharmawansa
Supervisor: Dr. R.M.A.P. Rajatheva

13.5. Masters Students’ Theses and Research Studies

A Framework for Reliable Reputation Management in Online Auctions
By: Ami Shrestha
Supervisor: Prof. Phan Minh Dung

A Radio Aware Routing Metric for WLAN Mesh Networks
By: Ranil Santhish Gamage
Supervisor: Dr. Poompat Saengudomlert

A Semantic Web-based Framework for Adaptive Authoring of E-Learning Objects
By: Anusha Joshi
Supervisor: Prof. Vilas Wuwongse

An Agent-based Architecture to Support Pervasive Context-Aware Applications
By: Sanjil Shrestha
Supervisor: Dr. Paul Janecek

Building a Rating Model for Weblogs
By: Nguyen The Manh
Supervisor: Dr. Jaakko Kurhila

Building Trust in Social Software: A Special Case "The Discussion Board"
By: Pallavi Mohapatra
Supervisor: Dr. Sumanth Guha

Data Mining for Financial Aid Optimization
By: Le Van Thanh
Supervisor: Prof. Peter Haddawy

Development of an Automated Real-time Performance Measurement and Visualization Framework for Mobile Ad-hoc Networks
By: Shuprabha Shakya
Supervisor: Prof. Kanchana Kanchanasut

Dynamic-Address-Allocation Based Routing for Scalability Support in Wireless Mesh Networks
By: Satish Chandra Jha
Supervisor: Prof. Kazi Mohiuddin Ahmed

Dynamic Bandwidth Allocation Algorithm for QoS-Aware Per-Queue EPON with Overhead Control
By: Pallab Kumar Choudhur
Supervisor: Dr. Poompat Saengudomlert

Electronic Service Deployment in Ho Chi Minh City, Vietnam: Supplying Personal Certificates for Citizens
By: Dinh Trieu Duong
Supervisor: Dr. Jaakko Kurhila

Evaluation of DHT Optimized DSR for Mobile Ad hoc Networks
By: Archana Bhattarai
Supervisor: Prof. Kanchana Kanchanasut

Expertise Finding Based on Task and User Modelling
By: Nguyen Duc Nghia
Supervisor: Dr. Jaakko Kurhila

Multi-User Detection on Uplink Asynchronous DS-CDMA Relay Channel in Rayleigh Fading
By: Eranda Harshanath Jayatunga
Supervisor: Dr. R.M.A.P. Rajatheva

Outdoor Mobile Robot Localization and Environment Mapping using a Single Camera
By: Akash Dev Nakarmi
Supervisor: Dr. Matthew Dailey

Performance Analysis of Space Time Coded MIMO Systems with Precoding
By: Suranga Saman Bandara
Supervisor: Dr. R.M.A.P. Rajatheva

Performance Analysis of Two Routing Protocols for Mobile Ad Hoc Wireless Networks
By: Shumawa May Thin
Supervisor: Dr. R.M.A.P. Rajatheva

Performance Study of Multi-Period Network Planning under Traffic Uncertainty
By: Ritihart Puengpholpool
Supervisor: Dr. Poompat Saengudomlert

Road Extraction from Satellite Imagery using Quadratic Snakes
By: Ramesh Marikhun
Supervisor: Dr. Matthew Dailey

Social Navigation for EDUCO E-learning Web-based System
By: San Thida Aung
Supervisor: Dr. Jaakko Kurhila

Study of User Behavior and Network Characteristics in a Multi-Operator Telecommunications Environment
By: Sunisa Luang
Supervisor: Assoc. Prof. Tapio J. Erke

Trend Template for Intrusion Detection
By: Md. Ahsan Habib
Supervisor: Prof. Phan Minh Dung

User Population Mobility Based Analysis of Cellular Networks
By: Mohamed Shahalan Cassim
Supervisor: Assoc. Prof. Tapio J. Erke

Using Wikis as a Collaboration Medium in Public Schools of Rural Nepal for Teachers and Students to Help and Support Students in their Learning Behavior to Pass the SLC Board Exam
By: Mohamed Shahalan Cassim
Supervisor: Prof. Phan Minh Dung
Research Study: Analyzing Security Features of Mobile Operating Systems
By: Dhruba Adhikary
Supervisor: Prof. Phan Minh Dung

Research Study: Application of WiMAX: A Case Study of Wireless DSL in Hochiminh City
By: Do Phi Son
Supervisor: Prof. Kazi Mohiuddin Ahmed

Research Study: Building an Integrated Environment Information Service
By: Sanjeet Amatya
Supervisor: Prof. Phan Minh Dung

Research Study: Development of a Personal Learning Environment (PLE) to Support a Distance Teacher Education Programme (DTEP) for Samtse College of Education, Bhutan
By: Pema Tshering
Supervisor: Dr. Paul Janecek

Research Study: Ontology-based Semantic Job Matching
By: Krishna Prasad Paudel
Supervisor: Prof. Phan Minh Dung

By: Do Anh Tuan
Supervisor: Assoc. Prof. Tapio J. Erke

Research Study: Study of Triangular Routing in Mixed IPv4/IPv6 Networks
By: Preeda Jaiton
Supervisor: Dr. Teerapat Sanguankotchakorn

Research Study: Trust Ontology for Online Business
By: Le Van Tuan
Supervisor: Prof. Phan Minh Dung