KITTIPAT APICHARTTRISORN

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Air Traffic Data Systems Engineering Department
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OBJECTIVE

A Ph.D. student position in computer science with research interest in computer networks, distributed resource allocation, sensor networks, software-defined networking, and internet of things.

EDUCATION

Master of Science, Computer Science
Chulalongkorn University, Bangkok, Thailand GPA 3.75 / 4.00 May 2007 - November 2010
THESIS - Distributed Time Synchronization in Wireless Sensor Networks
ADVISOR - Asst. Prof. Dr. Chalermek Intanagonwiwat

Bachelor of Engineering, Electrical Engineering
Kasetsart University, Bangkok, Thailand GPA 2.49 / 4.00 June 2000 - October 2004
SENIOR PROJECT: Adaptive Multi-Rate - Wideband (AMR-WB) speech codec Testing
SENIOR PROJECT SUPERVISOR: Assoc. Prof. Dr. Mongkol Raksapatcharawong

EMPLOYMENT

Senior Systems Engineer January 2007 - Present
Air Traffic Data Systems Engineering Department
Aeronautical Radio of Thailand, Bangkok, Thailand

- Administer, monitor, and maintain aeronautical data systems for which the Air Traffic Data Systems Engineering Department take responsibility so that the systems operate to support availability, safety and continuity of air navigation services
- Perform preventive maintenance, corrective maintenance, software and hardware installation, and deployment of monitoring systems (e.g. ICMP, SNMP)
- Inspect and troubleshoot problems, coordinate and consult with related internal and external aeronautical units to troubleshoot problems and investigate causes of interruption or outage of data systems services
- Gather information from users and report usage and service problems to managers, programmers and the director, to improve systems' reliability, availability and serviceability

Network Engineer March 2005 - September 2006
1tonet Co., Ltd., Bangkok, Thailand

- Design and implement voice over IP subsystems
- Integrate IP telephony with customers' existing public exchange systems

PUBLICATIONS

- **"A Moving Object Tracking Algorithm Using Support Vector Machines in Binary Sensor Networks"**

  Authors Dusadee Apicharttrisorn, Kittipat Apicharttrisorn and Teerasit Kasetkasem
  Publication Name The 13th International Symposium on Communications and Information Technologies
  Publication Date September 2013
  Abstract *Wireless sensor technologies have enabled us to deploy such small sensors to monitor an area of interest. Object tracking is one of the most attractive applications to be implemented with wireless sensor networks (WSNs). However, many solutions are struggled with energy-draining global positioning system (GPS), poorly-performed trilateration for indoor usage, and impractical, complex algorithms to be implemented in sensor nodes. This paper proposes a moving object tracking algorithm using support vector machines (MOT-SVM). The MOT-SVM takes advantage of light-weighted directional binary sensor networks, and state-of-the-art signal processing algorithms, namely the support vector machines and particle filters. We compare our proposed algorithm with the Aslam's work through the simulation. We examine our algorithms for various movement scenarios such as the linear, random and the 8-model trajectories, and the scenarios in which observing sensors make observation errors.*

- **"Desynchronization with an artificial force field for wireless networks"**

  Authors Supasate Choochaisri, Kittipat Apicharttrisorn, Kittiporn Korprasertthaworn, Pongpakdi Taechalertpaisarn and Chalermek Intanagonwiwat
  Publication Name SIGCOMM Computer Communication Review
  Publication Date March 2012
  Abstract *Desynchronization is useful for scheduling nodes to perform tasks at different time. This property is desirable for resource sharing, TDMA scheduling, and collision avoiding. Inspired by robotic circular formation, we propose DWARF (Desynchronization With an ARtificial Force field), a novel technique for desynchronization in wireless networks. Each neighboring node has artificial forces to repel other nodes to perform tasks at different time phases. Nodes with closer time phases have stronger forces to repel each other in the time domain. Each node adjusts its time phase proportionally to its received forces. Once the received forces are balanced, nodes are desynchronized. We evaluate our implementation of DWARF on TOSSIM, a simulator for wireless sensor networks. The simulation results indicate that DWARF incurs significantly lower desynchronization error and scales much better than existing approaches.*

- **"Energy-Efficient Gradient Time Synchronization for Wireless Sensor Networks"**

  Authors Kittipat Apicharttrisorn, Supasate Choochaisri and Chalermek Intanagonwiwat
  Publication Name 2010 Second International Conference on Computational Intelligence, Communication Systems and Networks (CICSyN)
  Publication Date July 2010
  Abstract *Wireless sensor network (WSN) applications usually demand a time-synchronization protocol for node coordination and data interpretation. In this paper, we propose an Energy-Efficient Gradient Time Synchronization Protocol (EGTSP) for Wireless Sensor Networks. In contrast to FTSP, a state-of-the-art synchronization protocol for WSNs, EGTSP is a completely localized algorithm that achieves a global time consensus and gradient time property using effective drift compensation and incremental averaging estimation. In contrast with GTSP, a gradient-based fixed-rated time synchronization protocol, our protocol provides adaptive beaconing for applications to optimize energy savings by selecting appropriate message-broadcast periods. The protocol is implemented and evaluated on multi-hop networks that consist of Telosb motes running TinyOS. The experimental results indicate that our protocol achieves a network-wide global notion of time, attains small synchronization errors, and utilizes energy efficiently.*

ACADEMIC PROJECTS

- Project Name: Time Synchronization for Wireless Sensor Networks

  Objective MS Thesis's Research Project
  Description Time synchronization is a challenging but important task for wireless sensor networks (WSNs) because of the resource-constrained characteristics. This project aims to explore a distributed protocol and algorithm of time synchronization that is time-accurate and energy-efficient while maintaining a gradient time property.
  Period January 2008 - October 2010
  Roles and Responsibility Main investigator who reviews literature, designs, analyzes, and implements algorithms, finally produces a publication
  Tools and Environments TinyOS, Ubuntu, Gnuplot, TelosB* motes

- Project Name: Desynchronization as Distributed Resource Allocations and TDMA

  Objective Research Project
  Description Desynchronization is an abstraction that arranges nodes declaring to access a shared resource in a round-robin schedule. It can be applied to solve resource allocation problems especially in distributed systems. This research project aims to explore a novel distributed desynchronization algorithm.
  Period March 2010 - Present
  Roles and Responsibility Literature review, experiments, and publications
  Tools and Environments TinyOS, TOSSIM, Ubuntu, Gnuplot

- Project Name: Moving Object Tracking in Binary Sensor Networks

  Objective Research Project
  Description Moving object tracking is a potential application of wireless sensor networks. Binary sensor networks require nodes only to send one-bit information to the central processing node which is responsible for signal processing tasks to track a moving object. This research project aims to explore a signal processing algorithm that tracks the object more accurately with tolerance to signal errors.
  Period March 2013 - Present
  Roles and Responsibility Literature review, experiments, and publications
  Tools and Environments Matlab

- Project Name: Distributed Online Ticket Reservation with Display on Google Maps

  Objective Term Project (Graduate Course: Distributed Systems)
  Description This project aims to provide an opportunity for students to design and implement a distributed system which reserves online tickets and displays the status through Google Maps.
  Period June 2008 - October 2008
  Roles and Responsibility Design overall systems and demonstration
  Tools and Environments Microsoft .NET and Google Map APIs

- Project Name: Thailand's Undergrad Admission Systems: Information Systems Architecture

  Objective Term Project (Graduate Course: Information Systems Architecture)
  Description This project aims to provide an opportunity for students to design Thailand's Undergrad Admission Systems. During this term project, we combine each other's experience and viewpoints of information systems and brainstorm the viable solutions for the systems. The final document consists of the design of network, database, hardware, middleware, and software. The designed architecture is supposed to support thousands of concurrent users who use the system from registrations to final admission reports.
  Period June 2007 - October 2007
  Roles and Responsibility Part of group discussion and brainstroming sessions
  Tools and Environments MS Words, MS Visio

- Project Name: Adaptive Multi-Rate - Wideband (AMR-WB) speech codec Testing

  Objective Undergraduate Senior Project (Electrical Engineering Project)
  Description Adaptive Multi-Rate Wideband (AMR-WB) is a patented wideband speech coding standard developed based on Adaptive Multi-Rate encoding, using similar methodology as Algebraic Code Excited Linear Prediction (ACELP). AMR-WB provides improved speech quality due to a wider speech bandwidth of 50 - 7000 Hz compared to narrowband speech coders which in general are optimized for POTS wireline quality of 300 - 3400 Hz. This project aims to document the study of AMR-WB in both theoretical and practical aspects.
  Period June 2003 - Mar 2004
  Roles and Responsibility Design and conduct experiments, and document a project report
  Tools and Environments MS Visual C

* TelosB is a WSN platform that is widely used by research laboratories worldwide.

PROFESSIONAL PROJECTS

- Project Name: Aeronautical Message Switching Systems (AMSS)

  Description AMSS is a core aeronautical data system that switches, stores and manipulates aeronautical messages interexchanged between aeronautical units worldwide so that flights are operated and managed properly and continuously.
  Roles and Responsibilities Administer, monitor, and maintain the system, inspect and troubleshoot problems
  Tools and Environments Redhat Enterprise, Windows Servers, Oracle Database 10g, Cisco switches and routers

- Project Name: Aeronautical Message Handling Systems (AMHS) and X.400

  Description According to ICAO*, Aeronautical Message Handling System is a new standard for aeronautical ground-ground communications (e.g. for the transmission of NOTAM**, Flight Plans or Meteorological Data) based on X.400 profiles. Aeronautical Radio of Thailand progresses to establish AMHS connectivity with several countries such as India, Singapore, Hong Kong, Italy, Laos, Vietnam, and Cambodia.
  Roles and Responsibilities Test and record system connectivity and functionality
  Tools and Environments Redhat Enterprise, Oracle Database 10g, ATN Routers

- Project Name: Flight Data Management Center

  Description Flight Data Management Center was established to unify clearance of national flight plans and their modifications to a single center in order to streamline air navigation operations. Computer-based systems are used to provide the functionality of FDMC.
  Roles and Responsibilities Administer, monitor, and maintain the system, inspect and troubleshoot problems
  Tools and Environments Java, Redhat Enterprise, MS Windows Servers, Oracle Database, Cisco switches and routers

- Project Name: Operational Aeronautical Meteorological Data (OPMET) and Regional OPMET Bulletins Exchange (ROBEX) Systems

  Description Aeronautical Radio of Thailand was designated to provide a regional OPMET data bank of the Asia/Pacific region. Its core function is to accumulate and store aeronautical meteorological data that can be retrieved remotely and automatically by queries from relevant aeronautical organizations. ROBEX processes such data in the form of bulletins, a periodic conclusive report, and periodically send them to related aeronautical units.
  Roles and Responsibilities Administer, monitor, and maintain the systems, inspect and troubleshoot problems

Tools and Environments Java, Redhat Enterprise, MS Windows Servers, Oracle Database, Cisco switches and routers

* ICAO (International Civil Aviation Organization) is a specialized agency of the United Nations which codifies the principles and techniques of international air navigation and fosters the planning and development of international air transport to ensure safe and orderly growth. Its headquarters are located in the Quartier International of Montreal, Quebec, Canada.

** NOTAM (Notice to Airmen) is a notice filed with an aviation authority to alert aircraft pilots of potential hazards along a flight route or at a location that could affect the safety of the flight. Aeronautical Radio of Thailand is authorized to provide a NOTAM data bank that stores and retrieves NOTAM messages which are distributed by AMSS and AMHS.

GRANTS

- Grant Name: International Conference Attendance Support Grants for Graduate Students

  Period July 2010
  Purpose This grant provides partial financial support for graduate students whose academic papers are accepted to be presented at an international conference.
  Amount Approximately 900 USD
  Granted by Graduate School, Chulalongkorn University Bangkok, Thailand

- Grant Name: AINTEC* 2010 Conference Attendance Grants

  Period November 2010
  Purpose This grant provides full financial support for graduate students who are interested in Internet research so that they can attend and participate in this academic conference.
  Amount Attendance Fee (Unknown)
  Granted by Thailand Research Education Network Association (ThaiREN), Bangkok, Thailand

- Grant Name: AINTEC* 2008 Conference Attendance Grants

  Period November 2008
  Purpose This grant provides full financial support for graduate students who are interested in Internet research so that they can attend and participate in this academic conference.
  Amount Attendance Fee (Unknown)
  Granted by Thailand Research Education Network Association (ThaiREN), Bangkok, Thailand

* AINTEC (Asian INTernet Engineering Conference) is an international conference held in Thailand and hosted by Internet Education and Research Laboratory, Asian Institute of Technology, Thailand `http://www.interlab.ait.ac.th/`. This single-tracked conference attracts high-quality papers from global Internet research communities.

ACADEMIC ACTIVITIES

- **Event** IEEE International Conference on Computer Communications (INFOCOM 2012)

  Activity Review papers delegated by Asst. Prof. Dr. Chalermek Intanagonwiwat

- **Event** IEEE International Conference on Computer Communications (INFOCOM 2011)

  Activity Review papers delegated by Asst. Prof. Dr. Chalermek Intanagonwiwat

CERTIFICATES

- Certificate Name: *"Embedded Software Engineering"*

  Content Embedded Hardware Architecture, Operating Systems for Embedded Systems, Programming Embedded Systems, Embedded Systems I/O, Embedded Software Engineering

  Certified by Computer Engineering Department, Chulalongkorn University and Software Industry Promotion Agency (SIPA)

  Duration 22 - 27 October 2007

- Certificate Name: *"Certified Thaicom Users"*

  Content General functionality of THAICOM satellites, Basic VSAT setup, Signal optimization and interference

  Certified by THAICOM Public Company Limited

  Duration 3 April 2007

- Certificate Name: *"Network Design and Implementation I"*

  Content Design, analysis, implementation and troubleshooting of computer networks and hands-on workshops with CISCO routers and switches

  Certified by Continuing Education Center, Chulalongkorn University

  Duration 29 January 2005 - 23 April 2005

SKILLS

Programming Languages

- C, C++, NesC, TinyOS, Matlab, Java, Python, SQL

Computer Software

- Ubuntu, UNIX, Gnuplot, Latex.

Language Proficiency

- English: TOEFL 107 iBT (Test Date: 24 November 2013)
  Reading: 26 / 30, Listening: 29 / 30, Speaking: 22 / 30, Writing: 30 / 30
- Thai: Native

Graduate Record Examination

- Test Date: 21 October 2013
- Verbal Reasoning Score: 152 / 170 (53^{rd} *Percentile Rank*)
- Quantitative Reasoning Score: 164 / 170 (89^{th} *Percentile Rank*)
- Analytical Writing Score: 4.0 / 6.0 (54^{th} *Percentile Rank*)

VOLUNTEER SERVICES

- Event Name: CANSO* Global ATM Summit and 15th Annual General Meeting (AGM)

  Period 11 June 2011 - 14 June 2011
  Description : As Air Chief Marshal Somchai Thean-anant, a former President of Aeronautical Radio of Thailand delivered a policy to recruit the company's employees to volunteer to help organize these eminent events that welcomed hundreds of worldwide dignitaries and executives from all segments of the aviation industry. I applied for a volunteer position and was then selected, under the supervision of Ms. Tipaporn Nippakakorn, Vice President (Human Resource), to help organize the conference and seminar rooms at the Renaissance Hotel, Bangkok.
  Contributions : Help organize meeting rooms
  Benefits : Overall, the company succeeded in organizing these meetings which brought about and strengthen collaboration and understanding between global aeronautical organizations. My personal benefits included friendship with other employees from various departments of the company and awareness of aviation industry's next generation gathered during the conference and seminar attendance. Most importantly, I learn to volunteer myself to contributing back to my organization and aviation society without any pay.

  *CANSO the Civil Air Navigation Services Organization is the global voice of air navigation service providers (ANSPs) worldwide. CANSO's members support over 85 percent of world air traffic and share information and develop new policies, with the ultimate aim of improving air navigation services (ANS) on the ground and in the air.

INTERESTS AND HOBBIES

Jazz and blues guitar, photography, cooking, swimming

REFERENCES

- Ms. Tipaporn Nippakakorn

  Position Vice President (Human Resource)
  Address Aeronautical Radio of Thailand, Bangkok, Thailand, 10120
  Email tipaporn.ni@aerothai.co.th
  Tel. (+66) 2285-9179

- Dr. Chalermek Intanagonwiwat

  Position Senior Software Engineer
  Address Cisco Systems, Inc., California, USA
  Email cintanag@cisco.com
  Tel. (+1) 408 525 3795

- Mr. Pongnarin Anantasirijinda

  Position Director of Air Traffic Data Systems Engineering Department
  Address Aeronautical Radio of Thailand, Bangkok, Thailand, 10120
  Email add@aerothai.co.th
  Tel. (+66) 2285-9101

- Asst. Prof. Dr. Teerasit Kasetkasem

  Position Assistant Professor of Electrical Engineering
  Address Electrical Engineering Department, Kasetsart University, Bangkok, Thailand, 10900
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  Tel. (+66) 2942-8555 ext 1536