



KITTIPAT APICHARTTRISORN

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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

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

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 of

PUBLICATIONS

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

Authors Dusadee Apicharttrisor, Kittipat Apicharttrisor and Teerasit Kasetkasem

Publication Name The 13th International Symposium on Communications and Information Technologies

Publication Date To appear

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 [1] 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 Apicharttrisor, 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 Apicharttrisor, 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 difficult but important task for wireless sensor networks (WSNs) because of their resource-constrained characteristics. This project aims to tackle this problem by exploring and researching distributed algorithms that are suitable for WSNs
Period January 2008 - October 2010
Roles and Responsibility Main investigator who reviews literature, designs, analyzes, and implements algorithms, finally produces an academic 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 participants to access a shared resource in a round-robin schedule. Our desynchronization algorithms have distinct features of fairness, scalability and stability. They support both single- and multi-hop networks. They are suitable for wireless sensor networks as they require minimal communication overheads of one-bit messages.
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 to track a moving object.
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 Graduate Course Project (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 Graduate Course Project (Information Systems Architecture)
Description This project aims to provide an opportunity for students to design Thailand's Undergrad Admission 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 admission reports.
Period June 2007 - October 2007
Roles and Responsibility Part of group discussion and brainstorming
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 507000 Hz compared to narrowband speech coders which in general are optimized for POTS wireline quality of 3003400 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 switch, store and manipulate aeronautical data sent and received by aeronautical units worldwide so that flights are operated and managed properly and according to ICAO's recommendations*.

Roles and Responsibilities Administer, monitor, and maintain the systems, 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, ATN Routers

- Project Name: Flight Data Management Center

Description Flight Data Management Center was established to unify clearance of flight plans and modifications to a single center in order to streamline air navigation operations.

Roles and Responsibilities Administer, monitor, and maintain the systems, inspect and troubleshoot problems

Tools and Environments Java, Redhat Enterprise, 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, 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 1200 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 104 iBT (Test Date: 25 Aug 2013)
Reading: 28, Listening: 26, Speaking: 22, Writing: 28
- Thai: Native

Graduate Record Examination

- Test Date: 21 October 2013
- Verbal Score: 152 / 170 , Quantitative Score: 164 / 170 , Analytical Writing:

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, President of Aeronautical Radio of Thailand at the moment delivered a policy to recruit the company's employees to volunteer to help organize this prestigious event that welcomes hundreds of worldwide dignitaries and executives from all segments of the aviation industry. I was willing to be part of this moment and hoped to help the company succeed in doing this job without any pay from the company. Under the supervision of Ms. Tipaporn Nippakakorn, Vice President (Human Resource), I was assigned to take care of the conference and seminar rooms at the Renaissance Hotel, Bangkok.

Contributions : Help prepare documents, organize meeting rooms

Benefits : Overall, the company succeeded in organizing this summit which brought and strengthen collaboration and understanding between global aeronautical organizations. My personal benefits include friendship with other employees from various departments of the company and a vision of the future of aviation industry gathered during the conference and seminar attendance. Most importantly, I learn to volunteer myself to contributing to the organization and aviation communities without anything monetary in return.

*CANSO the Civil Air Navigation Services Organisation 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, bodybuilding/aerobic exercise, cooking, swimming

REFERENCES

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