USC Online Graduate Application Summary

APPLICATION INFORMATION: Program of Study

Fall 2014	USC Viterbi School of Engineering	378	Computer Science (Ph.D.)
Term	College/School	POST/Program	

Dual degree program interest: _____ Applying to an online education program? Yes ☐ No ☑

Applying for full or part-time enrollment? **Full-time** Applying to a Viterbi Distance Education Network program? Yes ☐ No ☑

Not applicable	
Fee Waiver Type (If requested. Subject to the approval of USC Office of Admission)	Off-campus site (if applicable)

Are you a current degree-seeking student at USC? Yes ☐ No ☑ If previously applied to USC, indicate the following:

Term/Year: _____ School/College: _____ Undergraduate/Graduate: _____

Fulbright Scholarship recipient? Yes ☐ No ☑

IDENTIFICATION

Apicharttrisorn	Kittipat	
Last Name	First Name	Middle Name
Last Name – Other	First Name – Other	Middle Name – Other
	391612	
USC ID	AY Application ID	

DEMOGRAPHIC INFORMATION

I am an international student		Thailand
Residency	Alien Registration # (if applicable)	Country of Citizenship

Samutprakarn	Thailand	Thailand	Sep 2 1982
City of Birth	State/Territory/Region of Birth	Country of Birth	Birth date: Month/Day/Year

Asian-Other/ Asian-American
Ethnicity (optional)

	Male	Married
Ethnicity (optional), continued	Gender	Marital Status

ADDRESS & CONTACT INFORMATION: Permanent address same as current address? ☑

Current Address

7/639 Soi Vibhavadee 17 Vibhavadee-Rangsit Rd. Chatuchak		Bangkok
Street Address		City
Not Applicable	**Thailand**	**10900**
U.S. State/Territory	Country	Postal Code

Permanent Address

7/639 Soi Vibhavadee 17 Vibhavadee-Rangsit Rd. Chatuchak		Bangkok
Street Address		City
Not Applicable	**Thailand**	**10900**
U.S. State/Territory	Country	Postal Code

Telephone, Fax, E-Mail

66813433188		
Primary Telephone #	Alternate Telephone #	Fax #

kittipat.api@gmail.com
E-Mail Address

USC Online Graduate Application Summary

INTERNATIONAL APPLICANTS ONLY

General Information

1. International Applicant's Confirmation: I confirm that the information in the Biographical Section of this application - Legal first and last name, date of birth, county of birth and county of citizenship - matches exactly my information as it is listed on my passport. I understand that this information will be used to issue my I-20 or DS-2019 form, and that failure to provide complete and accurate information may severely delay the processing of my application. Do you confirm this statement? Yes ☑ No ☐
2. If you currently reside outside the United States you will need an I-20 or DS-2019 form to apply for your F-1 or J-1 visa at a U.S. embassy/consulate. Select the type of visa expected: **Student F-1 Visa**
3. Do you currently live in the United States? Yes ☐ No ☑
   a. Please select your current visa status: _____
   b. If you indicated a visa in 3a that is something other than F-1 or J-1, then please choose one of the following:
      ☐ I will apply for an F-1 visa outside the United States
      ☐ I will apply for F-1 status within the United States
      ☐ I will remain on my current visa for studies at USC.
4. Are you submitting multiple applications for graduate admission consideration at USC, at this time? Yes ☐ No ☑
5. If you answered "Yes" to question 4 and you are admitted to more than one program, please indicate your preferred program of study: _____

IF YOU ARE CURRENTLY ON AN F-1 OR J-1 STATUS:

6. Student and Exchange Visitor Information System (SEVIS) ID: _____
7. Educational institution that issued your current I-20 or DS-2019 (list USC, if applicable):
   _____
8. Are you currently participating in Optional Practical Training (OPT)? Yes ☐ No ☐
9. When does your Optional Practical Training Expire? ____/____
10. Expected SEVIS Transfer Release Date (Month/Year): ____/____
11. If you indicated that you have a J-1 visa, are you a student or a scholar? _____

Sources of Funding – Self-Reported

All amounts are reported in U.S. dollars. Funds information:

Personal	☐	$				
Family	☐	$	Source:		Sponsor Name:	
			Relationship to Sponsor:			
Gov't/Priv Agency	☐	$	Source			
Other	☐	$	Source			
TOTAL Funds		$				

Dependent Information

Are you bringing family members with you? Yes ☑ No ☐

DEPENDENT #1 Last/Family: **Apicharttrisorn** First: **Dusadee**

☑ Spouse ☐ Child Gender: **Female** Date of Birth (MM/DD/YYYY): **May / 30 / 1982**

Country of Birth: **Thailand** Country of Citizenship: **Thailand**

DEPENDENT #2 Last/Family: _____ First: _____

☐ Spouse ☐ Child Gender: _____ Date of Birth (MM/DD/YYYY): ____/____

Country of Birth: _____ Country of Citizenship: _____

USC Online Graduate Application Summary

INTERNATIONAL APPLICANTS ONLY - *Continued*

Dependent Information

DEPENDENT #3 Last/Family: _____ First: _____

☐ Spouse ☐ Child Gender: _____ Date of Birth (MM/DD/YYYY): / /

Country of Birth: _____ Country of Citizenship: _____

DEPENDENT #4 Last/Family: _____ First: _____

☐ Spouse ☐ Child Gender: _____ Date of Birth (MM/DD/YYYY): / /

Country of Birth: _____ Country of Citizenship: _____

DEPENDENT #5 Last/Family: _____ First: _____

☐ Spouse ☐ Child Gender: _____ Date of Birth (MM/DD/YYYY): / / 1982

Country of Birth: _____ Country of Citizenship: _____

ACADEMIC BACKGROUND: High School/Secondary School Information

IH0000	Not Found – International High School	
ETS Code	High School/Secondary School Name	
Bangkok		**Thailand**
City	U.S. State/Territory, Province or Region	Country
May / 1998 --- **May / 2000**		**May / 2000**
From: Month/Year To: Month/Year		Graduation Date

ACADEMIC BACKGROUND: Colleges & Universities

Please list the previous colleges and universities you have attended in chronological order, beginning with the first college or university you attended. Make sure to include your current institution and any ESL studies (if applicable).

College/University #1

TH0006	Kasetsart University	
ETS Code	College/University Name	
Bangkok		**Thailand**
City	U.S. State/Territory, Province or Region	Country
Jun / 2000 --- **Oct / 2004**		**Oct / 2004**
From: Month/Year To: Month/Year		Graduation Date or Expected Graduation Date

Bachelor of Engineering	Electrical Engineering
Degree Received	Major

College/University #2

TH0001	Chulalongkorn Univ.	
ETS Code	College/University Name	
Bangkok		**Thailand**
City	U.S. State/Territory, Province or Region	Country
May / 2007 --- **Oct / 2010**		**Oct / 2010**
From: Month/Year To: Month/Year		Graduation Date or Expected Graduation Date

Master of Science	Computer Science
Degree Received	Major

USC Online Graduate Application Summary

ACADEMIC BACKGROUND: Colleges & Universities - *Continued*

College/University #3

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

/ --- / / | From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

College/University #4

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

/ --- / / | From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

College/University #5

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

/ --- / / | From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

College/University #6

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

/ --- / / | From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

College/University #7

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

/ --- / / | From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

USC Online Graduate Application Summary

ACADEMIC BACKGROUND: Colleges & Universities – *Continued*

College/University #8

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

College/University #9

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

College/University #10

ETS Code | College/University Name

City | U.S. State/Territory, Province or Region | Country

From: Month/Year To: Month/Year | Graduation Date or Expected Graduation Date

NONE - I did not and will not earn a degree from this school.

Degree Received | Major

Have you attended additional colleges or universities? Yes ☐ No ☑

ACADEMIC BACKGROUND: General Information

Self-Reported Undergraduate GPA: **2.49**

Self-Reported Graduate GPA: **3.75**

Please list any publications you have authored or co-authored, and any academic honors, awards or scholarships you have received.

Dusadee Apicharttrisorn, Kittipat Apicharttrisorn and Teerasit Kasetkasem "A Moving Object Tracking Algorithm Using Support Vector Machines in Binary Sensor Networks" The 13th International Symposium on Communications and Information Technologies

Supasate Choochaisri, Kittipat Apicharttrisorn, Kittiporn Korprasertthaworn, Pongpakdi Taechalertpaisarn and Chalermek Intanagonwiwat "Desynchronization with an artificial force field for wireless networks" SIGCOMM Computer Communication Review

Have you ever been the subject of disciplinary or academic action at any college or university? Yes ☐ No ☑

If yes, what were the circumstances?

Have you taken courses or enrolled in a Viterbi DEN program in the past? Yes ☐ No ☑

Name of Company | Company Location

USC Online Graduate Application Summary

ACADEMIC BACKGROUND: Self-Reported Test Scores

Graduate Record Examination (GRE):

Date (Most recent taken):	Oct / 2013		
Best Verbal Score:	152	Verbal Percentile:	53
Best Quantitative Score:	164	Quantitative Percentile:	89
Best Analytical Score:	4.0	Analytical Percentile:	54
Best Cumulative Score:		Cumulative Percentile:	
GRE Subject Date:	/	Subject:	
GRE Subject Score:		Subject Percentile:	

Test of English as a Foreign Language (TOEFL)

Type: Internet Based Test

Date (Most recent taken):	Aug / 2013		
Reading:	28	Listening:	26
Speaking:	22	Writing:	28
Total Score:	104	Percentile:	

International English Language Testing System (IELTS)

Date (Most recent taken):	/		
Reading:		Listening:	
Speaking:		Writing:	
Total:			

Graduate Management Admission Test (GMAT):

Date (Most recent taken):	/		
Verbal Score:		Verbal Percentile:	
Quantitative Score:		Quantitative Percentile:	
Total Score:		Total Percentile:	
Analytical Writing Assessment (AWA)Score:		AWA Percentile:	

Additional Tests – Already Taken

Additional Test #1 _____

DATE: Month/Year: / Score: _____ Percentile: _____

Additional Test #2 _____

DATE: Month/Year: / Score: _____ Percentile: _____

Additional Tests – Planned

DATE: Month/Year: / Name of Test: _____

DATE: Month/Year: / Name of Test: _____

USC Online Graduate Application Summary

EMPLOYMENT INFORMATION

Current or Last Employer

Aeronautical Radio of Thailand	**Senior Systems Engineer**
Company	Position/Title
Air Traffic Data Systems Engineer and Administrator	**Jan / 2007 -- Jun / 2014**
Nature of Position	Dates Employed: From Month/Year - To Month/Year

Previous Employer

1tonet Co., Ltd.	**Network Engineer**
Company	Position/Title
Sales Support and VoIP Systems Engineer	**Mar / 2005 -- Sep / 2006**
Nature of Position	Dates Employed: From Month/Year - To Month/Year

LANGUAGE BACKGROUND

Thai				
Native/First Language				
Additional Language #1	Proficiency in:	Reading	Writing	Speaking
Additional Language #2	Proficiency in:	Reading	Writing	Speaking

Computer Languages:

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

FINANCIAL AID INFORMATION

Please indicate if you will apply for, or are interested in financial assistance including federal loans, work-study and private financing programs. Yes ☑ No ☐

Have you been awarded external, non-USC funding by a sponsoring agency? Yes ☐ No ☑

Agency name: _____

Other agency: _____

Applicant availability for USC employment: **Temporary work, Part-time work, Benefits-eligible full-time work**

Please list all fellowships or other forms of support you have been awarded, or for which you have applied.

USC Online Graduate Application Summary

ADDITIONAL QUESTIONS

Did your parents or siblings attend USC?	Yes ☐ No ☑
Are you the first generation to attend college?	Yes ☐ No ☑
Are your parents or your spouse employed by USC?	Yes ☐ No ☑
Are you a Viterbi Squared participant?	Yes ☐ No ☑
Do you wish to be considered for a graduate fellowship or assistantship?	Yes ☑ No ☐
Is your attendance contingent upon receiving a fellowship or teaching assistantship from the department?	Yes ☑ No ☐

How did you first learn of the program you are applying to? Faculty recommendation

Scholarly interest(s) and/or Research Topics:

SIMPLE-fying Middlebox Policy Enforcement Using SDN
Mapping the Expansion of Google's Serving Infrastructure
Reducing Web Latency: the Virtue of Gentle Aggression

Research Experience:

``Energy-Efficient Gradient Time Synchronization for Wireless Sensor Networks'' CICSyN 2010
In the paper, we designed an extended version of gradient time synchronization that was more time-accurate and energy-efficient, while maintaining a ``gradient'' property.
I was responsible for literature reviews, algorithm design and menuscript preparation.
``Desynchronization with an artificial force field for wireless networks'' SIGCOMM CCR
We design a desynchronization protocol, inspired by electromagnetic force field, that performs in a distributed manner, better scales with network sizes and densities and produces less desynchronization errors. I was responsible for the introduction and related work parts.
``A Moving Object Tracking Algorithm Using Support Vector Machines in Binary Sensor Networks'', ISCIT 2013, we used a signal processing technique to track a moving object in a field given binary sensor observation. In this paper, I was fully responsible for the manuscript prepara

Faculty:

Professor Dr. Ramesh Govindan
Assistant Professor Dr. Ethan Katz-Bassett
Assistant Professor Dr. Minlan Yu

If you are a Global Medicine applicant, please indicate your Preferred Track

Preferred Track:

USC Online Graduate Application Summary

RECOMMENDERS

			Online Recommender?
Chalermek	**Intanagonwiwat**	**cintanag@cisco.com**	Yes ☑ No ☐
Recommender 1 Name		E-mail Address	
Teerasit	**Kasetkasem**	**fengtsk@ku.ac.th**	Yes ☑ No ☐
Recommender 2 Name		E-mail Address	
Yunyong	**Teng-amnuay**	**yunyong.t@chula.ac.th**	Yes ☑ No ☐
Recommender 3 Name		E-mail Address	
			Yes ☐ No ☐
Recommender 4 Name		E-mail Address	
			Yes ☐ No ☐
Recommender 5 Name		E-mail Address	
			Yes ☐ No ☐
Recommender 6 Name		E-mail Address	

SIGNATURE

Applicant's Affidavit

I certify that the information on this application is complete and correct, and that I have attended, or am attending, no institutions other than those listed. I understand that all documents submitted for admission consideration become the property of the University of Southern California and will not be returned to me or duplicated for me for any reason. I also understand that acceptance to USC is subject to verification of final records from all institutions I have attended and that the application fee is non-refundable.

E-Signature Date of E-Signature

Application Details:

Submitted Date: _____ Payment Type: _____

Source: _____ Fee Payment: _____

Supplemental Application for Graduate Admission: USC Viterbi School of Engineering

Computer Science (Ph.D.)

IDENTIFICATION

First Name	Middle Name	Last Name
Kittipat		**Apicharttrisorn**

Term	Program of Study/ POST	AY Applicant ID
Fall 2014	**Computer Science (Ph.D.)**	**391612**

PROGRAM GROUP

Program Group: **Computer Science (Ph.D.)**

AREAS OF INTEREST

Area of Interest 1: **Area 1: Systems-Distributed Systems-Communication Networks**

Area of Interest 2: **Area 6: Databases and Information Systems**

Area of Interest 3: **Area 4: Artificial Intelligence**

Other Interest :

FACULTY

Please indicate faculty members are interested in working with or have been in contact with:

Faculty #1: **GOVINDAN Ramesh**

Faculty #2: **YU Minlan**

Faculty #3: **KATZ-BASSETT Ethan**

COMMENTS

KITTIPAT APICHARTTRISORN

Office Address
Air Traffic Data Systems Engineering Department
Aeronautical Radio of Thailand
Sathon, Bangkok, Thailand 10120
(+66) 2285-9177

Permanent Address
7/639 Vibhavadee-Rangsit Rd.
Chatuchak, Bangkok 10900
(+66) 2537-0097

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 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 104 iBT (Test Date: 25 Aug 2013)
  Reading: 28 / 30, Listening: 26 / 30, Speaking: 22 / 30, Writing: 28 / 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
  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
  Email fengtsk@ku.ac.th
  Tel. (+66) 2942-8555 ext 1536

Statement of Purpose

This statement of purpose is intended for use with my application to the Philosophy of Doctor graduate program at the Department of Computer Science, University of Southern California. This document starts by portraying my education background, both the Bachelor and Master's degrees. Then, it briefly states my professional experience and explains my research experience during my Master's degree study. Then my interest in USC's teaching and research is elaborated and finally my future plans after graduation are described. After finishing reading this statement of purpose, the committee will learn why I am qualified to be an excellent student of the program, what motivates me to pursue the doctoral degree at USC and why it is so important for my future profession that I earn this degree.

During my undergraduate study, in addition to a number of Electrical Engineering subjects, I studied a wide range of mathematical subjects including four Calculus courses, a course on Probability, and another on Linear Algebra and Complex Numbers, all of which are basic principles of Computer Science. Moreover, I passed two courses on computer programming, data structures and algorithms, which are the knowledge crucial to a successful computer scientist. However, during the first three years of the study, although I enjoyed learning the subjects, I was so shiftless and unmotivated that I did not pay much attention to my academic records. Not until the beginning of the forth year did I decide to boost my GPA as I was conscious that after that year I had to apply for a job and the currently low GPA would preclude me from competing with other students. This consciousness encouraged me to attend classes more frequently, pay more attention to the study materials, and better prepare for the examinations. As a result, my semester GPAs of the forth year were able to stay in a good standing until I graduated. Unfortunately, the total GPA was unable to increase much and remained at 2.49/4.00.

After graduation with the Bechelor of Electrical Engineering degree, I had to apply for a job to earn a living and support my family. I had worked for three companies until I settled my career at Aeronautical Radio of Thailand or Aerothai, a state enterprise under the Ministry of Transport, Thailand. One of Aerothai's principal missions is to provide air navigation services or air traffic control within Thailand's airspace. Specifically, the department of air traffic data systems engineering is responsible for the provision of data systems that support air traffic controllers' operations efficiently and continuously. At the department, my colleagues and I design, configure, and implement those systems by taking advantage of enterprise-graded information technology products, mostly of the USA, such as HP and Dell servers, Oracle and Microsoft databases, Cisco network equipment, and VMWare's virtualization technology, etc. Therefore, I have witnessed how these innovative products help transform air traffic data systems into more reliable and efficient systems. This hand-on, seven-year experience allows me to learn practical aspects of enterprise information systems with our safety-critical applications, and makes me interested in computer science, a core foundation of computer-related products and services. Moreover, the exposure to these technologies encourages me to plan to further my study in the US.

Not long after I started work for Aerothai did I decide to continue my education to the Master's degree in Computer Science at the Department of Computer Engineering, Chulalongkorn University. I had the following three main reasons. First, as a computer systems engineer, studying computer science would give me a professional advantage in terms of the received degree and knowledge. Second, this thesis-based curriculum would allow me to gain research experience in computer science, which would be crucial to my PhD study in the future. Third, in this program, I would have a chance to study a wide range of computer science subjects from Theory of Computation and Computer Algorithms to Computer Networks and Distributed Systems. During the study, I worked hard on studying materials, undertaking term projects and making progress toward my thesis work. As a result, I was able to earn a very good GPA of 3.75/4.00 in the Master's degree with the complete thesis titled "Distributed Time Sychronization for Wireless Sensor Networks".

My decision to pursue the Master's degree was correct because I gained a lot of valuable research experience there. At the department, I was a member of the Ubiquitous Network laboratory under the supervision of Associate Professor Dr. Chalermek Intanagonwiwat, who was also my advisor. At this lab, I learned at least three priceless lessons of research experience. First, I learned how to give academic presentations and to provide productive comments and feedbacks. Every week, one student was scheduled to present an academic paper of his or her interest and another was scheduled to present

the research progress of the selected thesis topic. Lab meetings encouraged this process of academic presentations and discussions that benefited not only the presenters but also the audiences. Second, I learned how to work on a thesis research project with my advisor. Every week, I also had to meet with him in order to report my progress toward my thesis and then had to go back and work on his suggestions and directions. I remember he once taught me that "I might be an expert in the field but not on the topic on which you are working. We need to learn together along the way until we reach the destination." This statement encouraged me to believe in my own research potentials and commence doing research since then. Third, I learned how to prepare a high-quality academic paper to get accepted for publication in academic conferences and journal publishers.

During the years of study at the Computer Engineering Department, I published two academic papers - one in an international conference's proceedings and the other in an ACM journal. When I prepared to submit an academic paper for the first time, I had to do three main tasks. First, I reviewed most prominent papers related to my topic and as I was reviewing, I learned the ideas of leading researchers in the field on the topic and how they presented them in the papers. However, I needed to come up with my own ideas, design my own solutions and compare my work with others'. Second, I needed to turn the ideas into the code implementation in a sensor network platform. Third, I had to explain and organize everything I had learned in an academic paper. According to my advisor, a high-quality paper should not only allow the readers to understand the overall picture of the work, but also enable them to implement it into the code themselves. Therefore, I explained the data structures, algorithms, and communication packets so clearly that one could use all this information for further experimentation. As a result, our paper titled "Energy-Efficient Gradient Time Synchronization for Wireless Sensor Networks", was accepted for publication. In the paper, we designed an extended version of gradient time synchronization protocols that was more time-accurate and energy-efficient, while maintaining a "gradient" property. With the gradient property, geographically adjacent nodes are able to maintain minimal synchronization errors.

In the other paper, all the co-authors had different tasks to finish, such as literature review, performance evaluation, and mathematical proofs. I was responsible for the introduction and related work parts. Our dedication and collaboration as well as the journal reviewers' valuable comments all played important roles in strengthening this piece of work. As a result, our paper titled "Desynchronization with an artificial force field for wireless networks" was accepted to publish in ACM SIGCOMM's *Computer Communication Review*. The desynchronization problem is analogous to a resource allocation problem in which nodes cooperate to take turns accessing to the same resource. In this paper, we provide a prove of convexity of this problem. Additionally, we design a desynchronization protocol, inspired by electromagnetic force field, that performs in a distributed manner, better scales with network sizes and densities and produces less desynchronization errors. Even after graduation, my interest and ambition to do research never abates. In 2013, I had a change to work on a research project with Associate Professor Dr. Teerasit Kasetkasem of Kasetsart University. In this project, we used a signal processing technique to track a moving object in a field given binary sensor observation. In this paper, I was fully responsible for the manuscript preparation and partly for experimental simulation. Finally, the paper titled "A Moving Object Tracking Algorithm Using Support Vector Machines in Binary Sensor Networks", was finally accepted for publication, marking my third publication.

I desire to advance my study to a PhD in the US because of the following three main reasons. First and most importantly, I want to be a professional researcher in computer science in the future, either in an academic institution or in a research laboratory and a doctoral degree is an important precursor to the research profession. Second, I agree with Matt Welsh, previously a professor of Computer Science at Harvard University, about a PhD study. He suggests that "You get an intense exposure to every subfield of Computer Science, and have to become the leading world's expert in the area of your dissertation work." For example, during my PhD study, I will have an opportunity to get exposed to a variety of academic subjects and research projects in computer science, such as Artificial Intelligence, Computer Graphics, Robotics, Databases, Systems, Software Engineering, Computational Science, etc., all of which will considerably expand my intellectual horizons in computer science. Moreover, the PhD study will train me to be an expert in the field of my dissertation through the educational systems and processes, together with my assiduous and persevering efforts. Third, I am conscious that studying at a PhD level requires an academically vibrant environment which includes surroundings with brilliant students and

faculty members, as well as accessible academic conferences and seminars. In my opinion, all of these are prevalent in the US educational systems and universities.

I aspire to become a PhD student at Department of Computer Science, University of Southern California, a prestigious university in the US, because I am particularly interested in its teaching and research. A graduate course, *Computer Communications*, taught by Professor Dr. Ramesh Govindan or Assistant Professor Dr. Ethan Katz-Bassett, requires students to study a variety of papers ranging from the classical papers regarding the design of the Internet to the more modern and visionary work pertinent to data center networks or software-defined networking. From my experience, simply reading those papers does not provide a tangible benefit for students.; it is the discussion and brainstorming between the students and the teacher that can lead to great ideas and innovations. Of course, great ideas alone do not suffice because computer scientists have to implement them to evaluate their performance and functionality. Therefore, in this course, students are required to do term projects. For example, in Fall 2013, students were asked to design a new transport protocol that reduced latency in data centers. Another graduate course, *Software-Defined Networking*, taught by Assistant Professor Dr. Minlan Yu, follows the same philosophy by having students explore classical and contemporary papers and finish a term project. In conclusion, I am excited to be part of these courses which provide students with theoretical and practical learning experience.

My current research interest includes Internet research and software-defined networks. Therefore, I am interested in the following research projects of the Networked Systems Laboratory at Department of Computer Science, USC. First, "Mapping the Expansion of Google's Serving Infrastructure" is an interesting experimental Internet measurement research project. Today's large-scaled web providers, such as Google, take advantage of content distribution networks (CDNs) in order to reduce the latency perceived by the Internet's users by distributing web serving infrastructures to various locations around the world. This project aims to enumerate the mapping between clients and serving infrastructures and quantify how effective the mapping algorithms are. This kind of projects gives me the idea not only whether CDNs work but also how well they work. In my opinion, the measurement techniques of this paper can be extended to analyze other providers which may use different DNS techniques.

I am also interested in Software-Defined Network (SDN) research. In my opinion, SDN is the future of computer networks because it allows network administrators or programmers to control overall behavior of the network through its control plane while letting the data plane of network devices send and receive data. From my experience with enterprise network infrastructures with hundreds of network ports, it is laborious to adjust the behavior of networks each time the policy has changed because I have to configure each device individually. With SDN, the network's intelligence is centralized to a control device where all the configurations and control take place. For example, in the paper "SIMPLE-fying Middlebox Policy Enforcement Using SDN", Assistant Professor et al. use SDN to enforce policies regarding middleboxes such as firewalls, VPN gateways, proxies, etc., above the layer 2 and 3 of TCP/IP at which SDN is supposed to function. Applying SDN to the application of middleboxes provides network officers with more flexibility and control. I am confident that my research experience and professional background will give me an advantage to do SDN research projects.

My plan after graduation with a doctoral degree is that I will look for a research or post-doc position that is related to the field of my dissertation in order to continue to accumulate research knowledge and experience. Therefore, within five years after graduation, I will become a real expert in the field and plan to lead my own research laboratory. Research experience gained during the PhD study and accumulated after graduation will play an important role in attracting funds and research students into my lab.

I would like to express my appreciation to the admission committee of University of Southern California for taking my statement of purpose and other application materials into consideration. I hope that the committee will be convinced that my educational background, academic and professional experience, and research motivation and ambition are sufficient evidences to suggest that I will be an excellent student of the PhD program and a competent researcher in computer science in the future.

Kittipat Apicharttrisorn

KASETSART UNIVERSITY
OFFICE OF THE REGISTRAR
BANGKOK 10900, THAILAND.

STUDENT ID 43051499
NAME Mr. Kittipat APICHARTTTRISORN
นายกิตติภัทร อภิชาติไตรสรณ์
DATE OF BIRTH September 2, 1982
PLACE OF BIRTH Thailand

DATE OF ADMISSION June 5, 2000
FACULTY OF Engineering
FIELD OF STUDY Electrical Engineering
DEGREE CONFERRED B.Eng. (Electrical Engineering)
DATE OF GRADUATION October 2, 2004

COURSE CODE	COURSE TITLE	GR	CR
First Semester 2000			
175126	Takraw	W	1
204111	Computers & Programming	C+	3
355111	Foundation English I	NP	3
417167	Engineering Mathematics I	B	4
420111	General Physics I	C	4
999021	Thai Language for Communication	C	3
	sem. G.P.A. = 2.39 cum. G.P.A. = 2.39		
Second Semester 2000			
175152	Fencing	F	(1)
208111	Engineering Drawing	D	3
355111	Foundation English I	NP	3
403111	General Chemistry	D	4
403112	Laboratory in General Chemistry	C+	1
417168	Engineering Mathematics II	C+	3
420112	General Physics II	B	3
420114	Laboratory in Physics II	C	1
999032	Thai Studies	D+	3
	sem. G.P.A. = 1.71 cum. G.P.A. = 2.00		
First Semester 2001			
204212	Data Structures & Algorithms I	W	3
205211	Electric Circuit Analysis I	C+	3
205214	Electrical Engineering Materials	W	3
208221	Engineering Mechanics I	D	3
208281	Workshop Practice	W	1
417267	Engineering Mathematics III	F	(3)
	sem. G.P.A. = 1.17 cum. G.P.A. = 1.82		
Second Semester 2001			
204221	Computer Organization & Assembly Language	C	3
205212	Electric Circuit Analysis II	C+	3
205213	Electric Circuit Laboratory	C	1
205251	Electronic Circuits & Systems I	D	3
205261	Electromechanical Energy Conversion I	C	3
205291	Electrical Practice	D+	1
417267	Engineering Mathematics III	C+	3
	sem. G.P.A. = 1.97 cum. G.P.A. = 1.86		
First Semester 2002			
205311	Signals & Systems	B+	3
205313	Applied Probability for Electrical Eng.	C	3
205341	Electromagnetic Fields & Waves I	D+	3
205351	Electronic Circuits & Systems II	D+	3
205352	Electronics Laboratory	C	1
205361	Electromechanical Energy Conversion II	D+	3
205362	Electromechanical Energy Conv. Lab. I	C	1
208241	Thermodynamics I	A	3
	sem. G.P.A. = 2.30 cum. G.P.A. = 1.97		

COURSE CODE	COURSE TITLE	GR	CR
Second Semester 2002			
205312	Electrical Engineering Analysis I	W	3
205321	Communication Systems I	B	3
205331	Electrical Measurements & Instrumentations I	D	3
205332	Linear Control Systems	D+	3
205354	Digital Circuits & Logic Design	C	3
205414	Digital Signal Processing	C	3
355111	Foundation English I (Audit)	NP	3
	sem. G.P.A. = 1.90 cum. G.P.A. = 1.96		
First Semester 2003			
175124	Handball	A	1
204212	Data Structures & Algorithms I	B	3
205312	Electrical Engineering Analysis I	A	3
205422	Communication Systems II	D+	3
205429	Satellite Communications	A	3
205442	Antenna Engineering	C+	3
205491	Electrical Engineering Project I	A	1
205497	Seminar	B+	1
355111	Foundation English I	P	3
	sem. G.P.A. = 3.14 cum. G.P.A. = 2.15		
Second Semester 2003			
205424	Digital Telephone System	B	3
205427	Data Communications & Networks	B	3
205428	Wireless Communications	A	3
205443	Antenna Engineering Laboratory	C+	1
205499	Electrical Engineering Project II	B+	2
206401	Introduction to Safety Engineering	D+	1
208281	Workshop Practice	C+	1
355112	Foundation English II	B+	3
417268	Engineering Mathematics IV	B	3
	sem. G.P.A. = 3.15 cum. G.P.A. = 2.30		
Summer Session 2004			
208222	Engineering Mechanics II	A	3
355113	Foundation English III	B+	3
	sem. G.P.A. = 3.75		
First Semester 2004			
175165	Weight Training	A	1
205214	Electrical Engineering Materials	A	3
355231	English Writing I	B+	3
387121	Introduction to Logic	B+	3
999012	Health for Life	B+	3
999141	Man & Society	B	3
	sem. G.P.A. = 3.53 cum. G.P.A. = 2.49		
	Field Work	Pass	

TRANSCRIPT CLOSED

OMRAT CHUSAWAT
Assistant Registrar

NOT VALID WITHOUT EMBOSSED UNIVERSITY SEAL

Given On October 15, 2013 *Checked by*

Explanation :

1. One credit hour is equal to 1 hour of lecture, recitation or quiz a week during a regular semester or 2-3 hours a week of practice during a regular semester.

2. Grading system :

A	:	excellent	=	4.0
B+	:	very good	=	3.5
B	:	good	=	3.0
C+	:	above average	=	2.5
C	:	average	=	2.0
D+	:	below average	=	1.5
D	:	poor	=	1.0
F	:	failed	=	0
S	:	satisfactory		
U	:	unsatisfactory		
P	:	pass		
NP	:	not pass		
W	:	withdrawn		
I	:	incomplete		

3. Credit symbols :

* or NR	=	not required in current curriculum or field of study.
( )	=	not accredited but required in current curriculum or field of study and included in computation of grade point average.

4. A minimum Cumulative Grade Point Average of 2.00 is required for receiving a Bachelor Degree.

StateAddlDoc2Upload

Kittipat Apicharttrisorn

CHULALONGKORN UNIVERSITY
BANGKOK 10330
THAILAND

NAME Mr. Kittipat Apicharttrisorn SEX Male STUDENT ID 5674391721

IDENTIFICATION NO. 4 1101 00025 18 0 BIRTHDATE Sep 2, 1982 RELIGION Buddhism

NATIONALITY Thai BIRTHPLACE Samutprakan

ADMISSION May 28, 2007 (B.E. 2550) GRADUATION Nov 8, 2010 (B.E. 2553)

PREVIOUS DEGREE B.Eng. / Oct 2, 2004

FACULTY Engineering

DEPT / PROGRAM Computer Engineering

FIELD OF STUDY Computer Science

DEGREE Master of Science

COURSE NO.	ABBREVIATED NAME	CREDIT	GRADE
	1ST SEMESTER 2007		
2110606	RES METH COMP ENG	3	S
2110671	DATABASE MGT SYS	3	B+
2110684	INF SYS ARCH	3	A
2110711	THEORY COMPUTATION	3	B+
9 12 3.67	9 12 3.67	33.00	
	2ND SEMESTER 2007		
2110681	COMPUTER ALGORITHM	3	B+
2110701	SEMINAR COM ENG I	1	S
2110795	ADV TOPIC NETWORK	3	A
6 7 3.75	15 19 3.70	55.50	
	1ST SEMESTER 2008		
2110654	ARTIFCL INTELL	3	A
2110731	DISTRIBUT SYS	3	A
2110811	THESIS	3	P
6 6 4.00	21 25 3.79	79.50	
	2ND SEMESTER 2008		
2110682	EMB/REAL-TIME SYS	3	B+
2110811	THESIS	9	P
3 3 3.50	24 28 3.75	90.00	
	1ST SEMESTER 2009		
2110639	COMP SYS SECURITY	3	V
2110811	THESIS	0	P
0 0 0.00	24 28 3.75	90.00	
	2ND SEMESTER 2009		
2110781	SPEC TOP DIST SYS	3	V
2110811	THESIS	0	P
0 0 0.00	24 28 3.75	90.00	
	1ST SEMESTER 2010		
2110811	THESIS	0	P
0 0 0.00	24 28 3.75	90.00	
CA CG GPA	CAX CGX GPAX	GPX	

Total credits registered = 46

Total credits earned = 40

Cumulative grade point average = 3.75

****

V-0

COURSE NO.	ABBREVIATED NAME	CREDIT	GRADE

COURSE NO.	ABBREVIATED NAME	CREDIT	GRADE

2110811 THESIS GOOD

TITLE : DISTRIBUTED TIME SYNCHRONIZATION FOR WIRELESS SENSOR NETWORKS

A = 4.00	I = INCOMPLETE	CA = CREDIT ATTEMPTED
B+ = 3.50	M = MISSING	CG = CREDIT GRANTED
B = 3.00	P = IN PROGRESS	GPA = GRADE POINT AVERAGE
C+ = 2.50	S = SATISFACTORY	CAX = CUMULATIVE CA
C = 2.00	U = UNSATISFACTORY	CGX = CUMULATIVE CG
D+ = 1.50	V = VISITOR	GPAX = CUMULATIVE GPA
D = 1.00	W = WITHDRAWN	GPX = CUMULATIVE GRADE POINT
F = 0.00	X = NO REPORT	

GRADUATION : GPAX OF 3.00 IS REQUIRED
THESIS : VERY GOOD, GOOD, PASS, FAILURE

CERTIFIED TRUE COPY

Vallapa Prakobphol

(Assoc. Prof. Vallapa Prakobphol)

REGISTRAR

DATE Nov 26, 2010 (B.E. 2553)

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