Overview of Network Research Group : NRG
Telecommunication System Research Laboratory
Department of Electrical Engineering
Faculty of Engineering, Chulalongkorn University
Bangkok, THAILAND

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Presented by :
Asst Prof Dr Chaodit Aswakul
NRG Co-founder

who we are

Network Research Group ... at CHULA

- Starting from 2001
- NRG currently has 2 faculty staffs and 14 students, comprising of 6 doctoral, 7 master’s, and 1 bachelor student.
- So far, with 1 graduating PhD, 20 alumni MEngs.

NRG@EE-CU

CE Lightwave & High-speed Comm., 10 Aug 2010

Asst Prof Dr Chaodit Aswakul
Assoc. Head of EE Department in Research Affairs
Post-Graduate Study Coordinator

BEng (Honours), Chula
PhD in Communication Network
Imperial College London (2001)
Assoc. Head of EE Department in Research Affairs
Post-Graduate Study Coordinator

Asst Prof Dr Chaiyachet Saivichit

BEng (Honours), Bristol U.
PhD in Communication Network
Imperial College London (2001)
Asst Head of EE Department in Information & International Affairs
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where we stand

### Strategic Research Areas

- **Telecommunications and Information Networking**
  - Telecommunication management
  - Network security, reliability and quality of service
  - Mobile internet (mobile-IP) & optical network
  - Next-generation network (NGN) and IP multimedia subsystem (IMS)
  - Mobile vehicular ad hoc network & wireless mesh network (WMN)
  - Wireless sensor network (WSN) & intelligent transportation systems (ITS)

@ EE-CU
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what we do

Examples of Research TOPICS of NRG that utilizes our Computer Cluster

- Service-Level-Agreement (SLA) Analysis in Next Generation Internet (NGI) with Cooperative/ Competing Operators;
- Wireless Mesh Network : Security Analysis of Eavesdropping & Jamming Attacks;
- Telecommunication Network Protocol in Intelligent Transport Systems (ITS) e.g. V2V/V2I ad hoc networking
- Network Optimization and Theoretical Capacity Analysis of High-Speed Wireless Ad Hoc Networking

MoVeNet
Mobile and Vehicular Networking

CoreGame
Core Networking and Game Theoretical Applications

WITS
Wireless Sensor Network & Intelligent Transport System

Server Room with Cluster Computer with MATLAB
Computer Cluster: Xeon Quad Core x 4

Parallel Processing of Cluster

Ongoing High-speed Network Research Using Cluster

Service-Level-Agreement (SLA) Analysis in Next Generation Internet (NGI) with Cooperative/Competing Operators

1 PhD Student, 1 Int.Journal Submission, 1 Int.Con.Paper

Wireless Mesh Network: Security Analysis of Evesdropping & Jamming Attacks

1 MEng Graduate, 1 MEng Student, 1 Int.Con.Paper
Optimal Relay Routing
Areas Prone to Attacks

Traffic Problem

This happens everyday … except (some) holidays

Ongoing High-speed Network Research Using Cluster
Telecommunication Network Application in Intelligent Transport Systems (ITS)

+ Travel Time +

1 PhD Student (TRIDI Scholarship), 1 MEng Graduate,
1 National Journal
ITS: CARS TALK

1 MEng Student, 1 Int.Con.Paper

ROAD SAFETY

CRASH!

PROTOCOL ARCHITECTURE
OF WIRELESS TESTBED

MANET TESTBEDS FOR EVALUATION OF REAL TIME CONTROLS IN MULTIMEDIA TRANSMISSION
Chula’s MANET Testbed


Area Traffic Signal Control

Micro-Simulator of Car Movements

Macro Bangkok Expressway Simulator

1 PhD Student, 1 Int.Journal Submission

1 MEng Graduate, 1 Int.Journal
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industries we work with

Project funding by CAT Telecom:
Software development for NGN design and performance analysis, 2007

Architecture of ngnSoft

Aim of Automatic ngnSoft

Automatically design VPNs for supporting main VPN service types (e.g. IP-Phone, IP-Centrex, VDO conf., Data)

Auto calculate network link capacity and its QoS according to QoS requirements (eg. call blocking, packet loss, packet delay)

Approximate minimum network cost
R-NGNsoft: robust network design, 2008
NSC: national software competition founded by NECTEC

QoS Monitoring for Mobile Communication
what else we do
THANK YOU
FOR YOUR ATTENTION

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Faculty of Engineering
Chulalongkorn University