

# WCNC 2006 TECHNICAL SESSIONS

## NETWORK LAYER

**MONDAY 3 APRIL 2006**  
**9:00-10:30 ROOM N232**

### **NET01: PHYSICAL LAYER DESIGN/ANALYSIS**

**Session Chair:** C. L. Law, Nanyang Technology University, USA

**NET01-1:** Conventional and Scrambling OFDM System Switch in Multicell Environments

**Haifeng Wang**, Nokia Corporation, Finland; **Jorma Lilleberg**, Nokia Corporation, Finland

**NET01-2:** Online PN Offset Planning: An Example of Cellular Network Autoconfiguration

**David Abusch-Magder**, Bell Labs, Lucent Technologies, USA; **A. Yuyin Chen**, Bell Labs, Lucent Technologies, USA; **Krysta D. Mirzayans**, Bell Labs, Lucent Technologies, USA; **Harish Viswanathan**, Bell Labs, Lucent Technologies, USA

**NET01-3:** Arrival Paths in Ultra Wideband Channels

**Yongwei Zhang**, The University of Manchester, UK; **A. K. Brown**, The University of Manchester, UK

**NET01-4:** On the Error Probability of a Noisy Channel Network Using Network Coding

**Ming Xiao**, Chalmers University of Technology, Sweden; **Tor M. Aulin**, Chalmers University of Technology, Sweden

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**11:00-12:30 ROOM N232**

### **NET02: CELLULAR NETWORK CAPACITY/HANDOFFS DESIGN**

**Session Chair:** W. F. Su, Buffalo University, USA

**NET02-1:** Cellular CDMA System Capacity in a Service Area with Tapered Traffic Distribution

**Masaharu Hata**, Okayama University, Japan; **Narihiro Shiraiishi**, Okayama University, Japan; **Shigeru Tomisato**, Okayama University, Japan

**NET02-2:** Evaluation of Handoff Algorithms Using a Call Quality Measure with Signal-based Penalties

**Malka N. Halgamuge**, The University of Melbourne, Australia; **Kotagiri Ramamohanarao**, The University of Melbourne, Australia; **Hai L. Vu**, Swinburne University of Technology, Australia; **Moshe Zukerman**, The University of Melbourne, Australia

**NET02-3:** Network-Controlled Cell-Breathing for Capacity Improvement in Heterogeneous CDMA/TDMA Scenarios

**J. Pérez-Romero**, Universitat Politècnica de Catalunya, Spain; **O. Sallent**, Universitat Politècnica de Catalunya, Spain; **R. Agustí**, Universitat Politècnica de Catalunya, Spain; **N. García**, Universitat Pompeu Fabra, Spain; **L. Wang**, King's College London, UK; **H. Aghvami**, King's College London, UK

**NET02-4:** Game-Theoretic Delay-Sensitive Multirate Power Control for CDMA Wireless Networks with Variable Path Loss

**Christopher A. St. Jean**, George Mason University, USA; **Bijan Jabbari**, George Mason University, USA

**MONDAY 3 APRIL 2006**  
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### **NET03: RESOURCE MANAGEMENT IN WIRELESS NETWORKS**

**Session Chair:** J. Graybeal, Bell Labs, USA

**NET03-1:** Power Saving in a Mobile Multimedia Terminal

**Jae-Sik Lee**, Chung-Ang University, Korea; **Byoung-Il Kim**, Chung-Ang University, Korea; **Jae-Pil Moon**, Chung-Ang University, Korea; **Tae-Gyu Chang**, Chung-Ang University, Korea; **Vijay K. Garg**, Chung-Ang University, Korea

**NET03-2:** Joint Radio Resource Management Based on Species Competition Model

**Guang Yang**, Beijing University of Posts and Telecommunications, China; **Jie Chen**, Beijing University of Posts and Telecommunications, China; **Kai Yu**, Beijing University of Posts and Telecommunications, China; **Ping Zhang**, Beijing University of Posts and Telecommunications, China; **Victor O. K. Li**, University of Hong Kong, China

**NET03-3:** Measurements of the Lost Call Rate as a Function of the Total Forward-Link Power on the Dominant Interfering Cell-Sector in a CDMA2000 Network

**Zhiyong Feng**, Beijing University of Posts and Telecommunications, China; **Kai Yu**, Beijing University of Posts and Telecommunications, China; **Yang Ji**, Beijing University of Posts and Telecommunications, China; **Ping Zhang**, Beijing University of Posts and Telecommunications, China; **Victor O. K. Li**, University of Hong Kong, China; **Yongjing Zhang**, Beijing University of Posts and Telecommunications, China

**NET03-4:** Multi-Access Radio Resource Management using Multi-Agent System

**Zhiyong Feng**, Beijing University of Posts and Telecommunications, China; **Kai Yu**, Beijing University of Posts and Telecommunications, China; **Yang Ji**, Beijing University of Posts and Telecommunications, China; **Ping Zhang**, Beijing University of Posts and Telecommunications, China; **Victor O. K. Li**, University of Hong Kong, China; **Yongjing Zhang**, Beijing University of Posts and Telecommunications, China

**TUESDAY 4 APRIL 2006**  
**9:00-10:30 ROOM N232**

### **NET04: TRANSPORT LAYER DESIGN FOR WIRELESS NETWORKS**

**Session Chair:** D. A. Magder, Bell Labs, USA

**NET04-1:** SCTP Efficient Flow Control During Handover

**Keun Jae Lee**, Samsung Electronics Co., Ltd., Korea; **Sang Su Nam**, Samsung Electronics Co., Ltd., Korea; **Byung In Mun**, Samsung Electronics Co., Ltd., Korea

**NET04-2:** E-RTO: An Enhanced TCP Retransmission Timeout Algorithm using SACK Option

**Myungjin Lee**, Electronics and Telecommunications Research Institute, Korea; **Oh-Cheon Kwon**, Electronics and Telecommunications Research Institute, Korea

**NET04-3:** Comparison of Different Active Queue Management Mechanisms for 3G Radio Network Controllers

**Jani Lakkakorpi**, Nokia, Finland; **Renaud Cuny**, Nokia, Finland

# NETWORK LAYER

**TUESDAY 4 APRIL 2006**  
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## **NET05: RESOURCE MANAGEMENT IN WIRELESS NETWORKS**

**Session Chair:** TBA

**NET05-1:** An H Approach to Congestion  
Controller Design for Wireless Access Networks

Feng Zheng, *University of Limerick, Ireland*; John  
Nelson, *University of Limerick, Ireland*

**NET05-2:** Admission Control for Multihop  
Wireless Backhaul Networks with QoS Support

Seungjoon Lee, *University of Maryland, USA*;  
Girija Narlikar, *Bell Laboratories, USA*; Martin Pál,  
*Bell Laboratories, USA*; Gordon Wilfong, *Bell  
Laboratories, USA*; Lisa Zhang, *Bell Laboratories,  
USA*

**NET05-3:** Axiomatic Multi-Transport Bargaining:  
A Quantitative Method for Dynamic Transport  
Selection in Heterogeneous Multi-Transport  
Wireless Environments

Qiuyi Duan, *Brigham Young University, USA*; Lei  
Wang, *Brigham Young University, USA*; Charles D.  
Knutson, *Brigham Young University, USA*; Michael  
A. Goodrich, *Brigham Young University, USA*

**NET05-4:** On QoS Constraints and Joint Source-  
Channel Coding for Real-Time Cooperative  
Multimedia Communications

Andres Kwasinski, *University of Maryland, USA*;  
H. Vicky Zhao, *University of Maryland, USA*; K. J.  
Ray Liu, *University of Maryland, USA*

**MONDAY 3 APRIL 2006**  
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## **NET06: NETWORK MODELING/ANALYSIS**

**Session Chair:** TBA

**NET06-1:** Available Bandwidth Estimation via  
One-Way Delay Jitter and Queuing Delay  
Propagation Model

Yu-Chen Huang<sup>1,2</sup>, *Academia Sinica, Taiwan*;  
*National Central University, Taiwan*; Chun-Shen  
Lu, *Academia Sinica, Taiwan*; Hsiao-Kuang Wu<sup>2</sup>

**NET06-2:** Comparison of Combined Preemption  
and Queuing Schemes for Admission Control in a  
Cellular Emergency Network

Jiazhen Zhou, *University of Missouri-Kansas City,  
USA*; Cory Beard, *University of Missouri-Kansas  
City, USA*

**NET06-3:** Impact of Network Subsystem on  
Reliable Transport Protocol Performance over  
Wireless Links

Zhiguo Xu, *University of California, Los Angeles,  
USA*; Mahesh Marina, *University of California, Los  
Angeles, USA*; Rajive Bagrodia, *University of  
California, Los Angeles, USA*

**NET06-4:** A Novel Scheduling Algorithm for  
Delay-Oriented Services Based on Hopfield Neural  
Networks Methodology

N. García, *Universitat Pompeu Fabra, Spain*;  
J. Pérez-Romero, *Universitat Politècnica de  
Catalunya, Spain*; R. Agustí, *Universitat  
Politécnica de Catalunya, Spain*

**MONDAY 3 APRIL 2006**  
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## **NET07: RESOURCE MANAGEMENT/ ARCH DESIGN FOR WIRELESS NETWORKS**

**Session Chair:** TBA

**NET07-1:** Location-Aware Caching for Spatial  
Queries in Dynamic Environments

Bo Yang, *The Pennsylvania State University, USA*;  
Ali R. Hurson, *The Pennsylvania State University,  
USA*

**NET07-2:** Algorithms for Routing and Centralized  
Scheduling in IEEE 802.16 Mesh Networks

Harish Shetiya, *Indian Institute of Science, India*;  
Vinod Sharma, *Indian Institute of Science, India*

**NET07-3:** Capacity and Quality Enhancement  
using an Adaptive Resource Allocation for Multi-  
beam Mobile Satellite Communication Systems

Katsuya Nakahira, *NTT Corporation, Japan*;  
Kiyoshi Kobayashi, *NTT Corporation, Japan*;  
Masazumi Ueba, *NTT Corporation, Japan*

**NET07-4:** Relay Placement for Minimizing  
Congestion in Wireless Backbone Networks

Abhishek Kashyap, *University of Maryland, USA*;  
Fangting Sun, *University of Maryland, USA*;  
Mark Shayman, *University of Maryland, USA*

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## **NET08: CELLULAR NETWORK DESIGN**

**Session Chair:** TBA

**NET08-1:** Position and Velocity Tracking in  
Mobile Cellular Networks Using the Particle Filter

Mohammed M. Olama, *University of Tennessee,  
USA*; Seddik M. Djouadi, *University of Tennessee,  
USA*; Chris S. Pendley, *University of Tennessee,  
USA*

**NET08-2:** Performance Evaluation of a Soft Hand  
Off Scheme in CDMA Cellular Networks

Tamba Korteque, *University of Toledo, USA*; Wei  
Li, *University of Toledo, USA*; Demetrios Kazakos,  
*University of Idaho, USA*

**NET08-3:** Reuse Partitioning in Fixed Two-Hop  
Cellular Relaying Network

Tao Liu, *Shanghai Jiao Tong University, PR China*;  
Mengtian Rong, *Shanghai Jiao Tong University,  
PR China*; Hongkui Shi, *Shanghai Jiao Tong  
University, PR China*; Dan Yu, *Siemens Ltd. China,  
China*; Yisheng Xue, *Siemens Ltd. China, China*;  
Egon Schulz, *Siemens AG, Germany*

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## **NET09: MULTIMEDIA TRANSPORT IN WIRELESS NETWORKS**

**Session Chair:** TBA

**NET09-1:** End-to-End Performance of the IMS  
over Various Wireless Networks

Dragos Vingarzan, *Fraunhofer-Institute for Open  
Communication Systems, Germany*; Peter Weik,  
*Fraunhofer-Institute for Open Communication  
Systems, Germany*

**NET09-2:** Quality of VoIP in Wireless  
Communication Networks

Jianming Zhang, *Beijing University of Posts and  
Telecommunications, China*; Dacheng Yang,  
*Beijing University of Posts and  
Telecommunications, China*

**NET09-3:** VoMESH: Voice Over Wireless MESH  
Networks

Kyungtae Kim, *Stony Brook University, USA*;  
Sangjin Hong, *Stony Brook University, USA*

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**NET09-4:** Optimal Rate Control for Video Transport over Multi-hop Wireless Networks

**Sastry Kompella**, Virginia Polytechnic Institute and State University, USA; **Shiwen Mao**, Virginia Polytechnic Institute and State University, USA; **Y. Thomas Hou**, Virginia Polytechnic Institute and State University, USA; **Hanif D. Sherali**, Virginia Polytechnic Institute and State University, USA

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### **NET10: ADMISSION/QOS DESIGN FOR WIRELESS NETWORKS**

**Session Chair:** P. Bosch, Bell Labs, USA

**NET10-1:** Admission Control and Pricing in Competitive Wireless Networks Based on Non-cooperative Game Theory

**Angelos N. Rouskas**, University of the Aegean, Greece; **Anastasios A. Kikilias**

**NET10-2:** Context Routing in Heterogeneous Pervasive Computing Fieldwork Environments

**Thienne Johnson**, University of Amazônia, Brazil; **Djamel Sadok**, Federal University of Pernambuco, Brazil

**NET10-3:** Application of Network Layer Mechanisms for Service Differentiation in 802.11 WLANs: Implementation and Experience

**Vasilios A. Siris**, Foundation for Research and Technology, Greece; **George Stamatakis**, Foundation for Research and Technology, Greece

**NET10-4:** Guarantee of Service Expectation Level and Fairness by Precise Queue Weight Allocation in AF PHB

**Sangkil Jung**, Stony Brook University, USA; **Sangjin Hong**, Stony Brook University, USA

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### **NET11: NEW WIRELESS NETWORK ARCHITECTURE & CHALLENGES**

**Session Chair:** TBA

**NET11-1:** Research Challenges and Applications for Underwater Sensor Networking

**John Heidemann**, University of Southern California, USA; **Wei Ye**, University of Southern California, USA; **Jack Wills**, University of Southern California, USA; **Affan Syed**, University of Southern California, USA; **Yuan Li**, University of Southern California, USA

**NET11-2:** Decentralized Architecture and Organizing Mechanisms for Distributed Terminal System

**Xu Wang**, Beijing University of Posts and Telecommunications, PR China; **Yang Ji**, Beijing University of Posts and Telecommunications, PR China; **Xiaosheng Tang**, Beijing University of Posts and Telecommunications, PR China; **Yinong Li**, Beijing University of Posts and Telecommunications, PR China; **Ping Zhang**, Beijing University of Posts and Telecommunications, PR China

**NET11-3:** On The Scalability of Relay-based Wireless Networks

**Adrian Florea**, Carleton University, Canada; **Halim Yanikomeroğlu**, Carleton University, Canada

**NET11-4:** Aeronautical Ad Hoc Networks

**Ehssan Sakhaee**, University of Sydney, Australia; **Abbas Jamalipour**, University of Sydney, Australia; **Nei Kato**, Tohoku University, Japan

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### **NET12: MULTIHOP WIRELESS NETWORK DESIGN**

**Session Chair:** W. F. Su, Buffalo University, USA

**NET12-1:** Smart Deployment/Movement of Unmanned Air Vehicle to Improve Connectivity in MANET

**Zhu Han**, University of Maryland, USA; **A. Lee Swindlehurst**, Brigham Young University, USA; **K. J. Ray Liu**, University of Maryland, USA

**NET12-2:** Efficient Backbone Synthesis Algorithm for Multi-Radio Wireless Mesh Networks

**Huei-jiun Ju**, University of California, Los Angeles, USA; **Izhak Rubin**, University of California, Los Angeles, USA

**NET12-3:** Mobile Base Stations Placement and Energy Aware Routing in Wireless Sensor Networks

**A. P. Azad**, Indian Institute of Science, India; **A. Chockalingam**, Indian Institute of Science, India

**NET12-4:** Comparative Study of Routing Metrics for Multi-Radio Multi-Channel Wireless Networks

**Wei Zhou**, Iowa State University, USA; **Dongbo Zhang**, Iowa State University, USA; **Daji Qiao**, Iowa State University, USA

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### **NET13: ADHOC NETWORK ROUTING I**

**Session Chair:** TBA

**NET13-1:** Mobility Adaptive Self-Parameterization of Routing Protocols for Mobile Ad Hoc Networks

**Oliver Stanze**, University of Karlsruhe, Germany; **Martina Zitterbart**, University of Karlsruhe, Germany; **Christian Koch**, University of Karlsruhe, Germany

**NET13-2:** PARIS: Path Availability Routing in Sensors

**Ming Yu**, State University of New York, USA; **Aniket Malvankar**, State University of New York, USA

**NET13-3:** Minimum Energy Path Planning for Ad Hoc Networks

**Danje Chen**, Massachusetts Institute of Technology, USA; **Philip J. Lin**, Draper Laboratory, USA

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### **NET14: ADHOC NETWORK ROUTING II**

**Session Chair:** TBA

**NET14-1:** Protocols for Roadside-to-Roadside Data Relaying over Vehicular Networks

**Barath Petit**, Georgia Institute of Technology, USA; **Mostafa Ammar**, Georgia Institute of Technology, USA; **Richard Fujimoto**, Georgia Institute of Technology, USA

**NET14-2:** Joint Power Control and Maximally Disjoint Routing for Reliable Data Delivery in Multihop CDMA Wireless Ad Hoc Networks

**Lijun Qian**, Prairie View A&M University, USA; **Ning Song**, Prairie View A&M University, USA; **Dhadesugoor R. Vaman**, Prairie View A&M University, USA; **Xiangfang Li**, Rutgers University, USA; **Zoran Gajic**, Rutgers University, USA

**NET14-3:** Compact Routing Discovery Protocol with Lower Communication Complexity

**Huafei Zhu**, Institute for Infocomm Research, Singapore; **Feng Bao**, Institute for Infocomm Research, Singapore; **Chunxiao Tricia Chigan**, Michigan Technological University, USA



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## **NET15: ADHOC NETWORK ROUTING III**

**Session Chair:** W. F. Su, Buffalo University, USA

**NET15-1:** Multipath Location Aided Routing in 2D and 3D

Soumendra Nanda, Dartmouth College, USA;  
Robert S. Gray, Dartmouth College, USA

**NET15-2:** Hybrid Routing with Periodic Updates (HRPU) in Wireless Mesh Networks

Ameya Damle, Southern Methodist University, USA; Dinesh Rajan, Southern Methodist University, USA; Stefano M. Faccin, Nokia, USA

**NET15-3:** Decoupled Multipath Structure for Throughput Enhancement in Wireless Mesh Networks

Xuhui Hu, City University of New York, USA; Yong Liu, Samsung Advanced Institute of Technology, USA; Myung J. Lee, City University of New York, USA; Tarek N. Saadawi, City University of New York, USA

**NET15-4:** OLSR-MC: A Proactive Routing Protocol for Multi-Channel Wireless Ad-Hoc Networks

Unghee Lee, Virginia Polytechnic Institute and State University, USA; Scott F. Midkiff, Virginia Polytechnic Institute and State University, USA

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## **NET16: ADHOC NETWORK ROUTING II**

**Session Chair:** P. Lin, Draper Lab, USA

**NET16-1:** Mobile Ad-Hoc Network Data Communication in Large Geographic Areas

Leslie D. Fife

**NET16-2:** Belief-based Packet Forwarding in Self-Organized Mobile Ad Hoc Networks with Noise and Imperfect Observation

Zhu Ji, University of Maryland, USA; Wei Yu, University of Maryland, USA; K. J. Ray Liu, University of Maryland, USA

**NET16-3:** On Upper Bounds on Communication Rates in Ad-hoc Networks with Non-Uniform Traffic Pattern

Sumeeth Nagaraj, University of Alberta, Canada; Christian Schlegel, University of Alberta, Canada; Dmitri Truhachev, University of Alberta, Canada

**NET16-4:** Modeling and Evaluation of Traffic Flow and Availability for Mobile Ad hoc Networks

Shensheng Tang, University of Toledo, USA; Wei Li, University of Toledo, USA; Junghwan Kim, University of Toledo, USA

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## **NET17: ADHOC NETWORK CONNECTIVITY**

**Session Chair:** TBA

**NET17-1:** A Performance Modeling of Connectivity in Ad Hoc Networks

M. K. Mehmet Ali, Concordia University, Canada; M. Khabazian, Concordia University, Canada

**NET17-2:** Link Duration of the Random Way Point Model in Mobile Ad Hoc Networks

Cheng-Lin Tsao, National Taiwan University, Taiwan; Yueh-Ting Wu, National Taiwan University, Taiwan; Wanjiun Liao, National Taiwan University, Taiwan; Jia-Chun Kuo, National Taiwan University, Taiwan

**NET17-3:** Connectivity and Minimum Total Transmit Energy per Packet between any Pair of Nodes in a Bounded Wireless Ad-Hoc Network Subject to Fading

Dan Avidor, Bell Laboratories-Lucent Technologies, USA; Sayandev Mukherjee, Bell Laboratories-Lucent Technologies, USA

**NET17-4:** Connectivity in Energy Balanced Traffic Distribution

Jing Wang, University of North Carolina at Charlotte, USA; Ivan Howitt, University of North Carolina at Charlotte, USA

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## **NET18: ADHOC NETWORK DESIGN/MODELING**

**Session Chair:** I. Howitt, USA

**NET18-1:** Effects of a Realistic Channel Model on Packet Forwarding in Vehicular Ad Hoc Networks

Marc Torrent-Moreno, University of Karlsruhe, Germany; Felix Schmidt-Eisenlohr, University of Karlsruhe, Germany; Holger Füller, University of Mannheim, Germany; Hannes Hartenstein, University of Karlsruhe, Germany

**NET18-2:** Adaptive Topology Control for Heterogeneous Mobile Ad hoc Networks Using Power Estimation

Xiaofeng Han, University of Delaware, USA; Chien-Chung Shen, University of Delaware, USA; Zhuochuan Huang, Diego Research Center, Inc., USA

**NET18-3:** QoS Provisioning and Queue Management in Mobile Ad hoc Networks

Shensheng Tang, University of Toledo, USA; Wei Li, University of Toledo, USA

**NET18-4:** Power-Aware Topology Control for Wireless Ad-Hoc Networks

Wonseok Baek, University of Southern California, USA; David S. L. Wei, Fordham University, USA; C.-C. Jay Kuo, University of Southern California, USA

**TUESDAY 4 APRIL 2006**  
**11:00-12:30 ROOM N232**

## **NET19: NETWORK MODELING/ANALYSIS**

**Session Chair:** TBA

**NET19-1:** Performance Evaluation of Data Aggregation Schemes in Wireless Sensor Networks

Sangjoon Park, North Carolina State University, USA

**NET19-2:** Power Efficient Stochastic – Wireless Sensor Networks

Jing Wang, University of North Carolina at Charlotte, USA; Ivan Howitt, University of North Carolina at Charlotte, USA

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**NET19-3:** A Near Optimum RREQ Flooding Algorithm in Sensor Networks

*Yashar Ghiassi-Farrokhfal, Sharif University of Technology, Iran; V. R. Arbab, Sharif University of Technology, Iran; M. R. Pakravan, Sharif University of Technology, Iran*

**NET19-4:** Design Optimization of Multi-Sink Sensor Networks by Analogy to Electrostatic Theory

*Mehdi Kalantari, University of Maryland, USA; Mark Shayman, University of Maryland, USA*

**THURSDAY 6 APRIL 2006**  
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### NET20: SENSOR NETWORK DESIGN II

**Session Chair:** *L. C. Wang, National Chiao-Tung University, Taiwan*

**NET20-1:** Lifetime Maximization by Cooperative Sensor and Relay Deployment in Wireless Sensor Networks

*Thanongsak Himsoon, University of Maryland, USA; W. Pam Siriwongpairat, University of Maryland, USA; Zhu Han, University of Maryland, USA; K. J. Ray Liu, University of Maryland, USA*

**NET20-2:** Adaptive Task Scheduling for Providing Event Miss-Ratio Statistical Assurances in Wireless Sensor Networks

*H. Ozgur Sanli, Arizona State University, USA; Hasan Çam, Arizona State University, USA*

**NET20-3:** Distributed Cooperative Routing Algorithms for Maximizing Network Lifetime

*Charles Pandana, University of Maryland, USA; W. Pam Siriwongpairat, University of Maryland, USA; Thanongsak Himsoon, University of Maryland, USA; K. J. Ray Liu, University of Maryland, USA*

**NET20-4:** Sector-based Routing for Secure Energy Efficient Communications

*Sudheer K. Chimbli, Sportspilot Inc., USA; Johnson P. Thomas, Oklahoma State University, USA; Venkatesh Sarangan, Oklahoma State University, USA; Ruiyi Zhang, Oklahoma State University, USA*

**TUESDAY 4 APRIL 2006**  
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### NET21: WLAN DESIGN

**Session Chair:** *V. Wong, University of British Columbia, Canada*

**NET21-1:** Improving the Accuracy of Wireless LAN based Location Determination Systems using Kalman Filter and Multiple Observers

*Raman Kumar K., Indian Institute of Technology, India; Varsha Apte, Indian Institute of Technology, India; Yogesh A. Powar, Indian Institute of Technology, India*

**NET21-2:** A Novel Hold-Mode-based Adaptive Inter-Piconet Scheduling Algorithm in Bluetooth Scatternets

*Ching-Fang Hsu, National Cheng Kung University, Taiwan*

**NET21-3:** Saturation Throughput of IEEE 802.11e EDCA Based on Mean Value Analysis

*Yuxia Lin, The University of British Columbia, Canada; Vincent W. S. Wong, The University of British Columbia, Canada*

**NET21-4:** QoS Provisioning in 802.11 WLAN Coupled with UMTS Network

*Chunming Liu, Florida International University, USA; Chi Zhou, Florida International University, USA*

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### NET22: WIRELESS PAN DESIGN

**Session Chair:** *D. Kim, Kyungpook National University*

**NET22-1:** Performance Study of IEEE 802.15.4 Using Measurements and Simulations

*Marina Petrova, RWTH Aachen University, Germany; Janne Riihijärvi, RWTH Aachen University, Germany; Petri Mähönen, RWTH Aachen University, Germany; Saverio Labela, RWTH Aachen University, Germany*

**NET22-2:** Measuring Effective Capacity of IEEE 802.15.4 Beaconless Mode

*Tony Sun, UCLA, USA; Ling-Jyh Chen<sup>2</sup>, Institute of Information Science, Taiwan; Chih-Chieh Han, UCLA, USA; Guang Yang, UCLA, USA; Mario Gerla, UCLA, USA*

**NET22-3:** Link State Clustering Based on IEEE 802.15.4 MAC for Wireless Ad-hoc/Sensor Networks

*Chao Gao, University of Vaasa, Finland; Riku Jäntti, University of Vaasa, Finland*

**NET22-4:** Performance Comparison of Overlaid Bluetooth Piconets (OBP) and Bluetooth Scatternet

*Sewook Jung, University of California, Los Angeles, USA; Alexander Chang, University of California, Los Angeles, USA; Mario Gerla, University of California, Los Angeles, USA*

**WEDNESDAY 5 APRIL 2006**  
**15:30-16:00 ROOM N233**

### NET23: WIRELESS NETWORK DESIGN

**Session Chair:** *S. Keshav, University of Waterloo, Canada*

**NET23-1:** A Successive Refinement Approach to Wireless Infrastructure Network Deployment

*N. Ahmed, University of Waterloo, Canada; S. Keshav, University of Waterloo, Canada*

**NET23-2:** BioNet: A Developer-Centric Middleware Architecture for Heterogeneous Devices and Protocols

*Kevin K. Gifford, University of Colorado, USA; Sebastian Kuzminsky, University of Colorado, USA; Shea Williams, University of Colorado, USA; John R. Saiz, NASA Johnson Space Center, USA*

**NET23-3:** A Metric to Increase Throughput in Untrustworthy Multi-hop Wireless Mesh Networks

*David Waiting, University of Cape Town, South Africa; Neco Ventura, University of Cape Town, South Africa*

**NET23-4:** Detection and Repair of Faulty Access Points

*H. J. Pan, University of Waterloo, Canada; S. Keshav, University of Waterloo, Canada*

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## **NET24: MOBILITY MANAGEMENT I**

**Session Chair:** *M. Chuah, Lehigh University, USA*

**NET24-1:** Performance Evaluation of Mobility Management Scheme in DTN

*Mooi Choo Chuah, Lehigh University, USA; Vinay Goel, Lehigh University, USA; Brian D. Davison, Lehigh University, USA*

**NET24-2:** Mobility in UMTS Packet IP Networks

*Peter Bosch, Bell Laboratories, USA; Sape Mullender, Bell Laboratories, USA; Sam Samuel, Bell Laboratories, USA*

**NET24-3:** An Enhanced Mobility Management Approach for Wireless IP Networks

*Jeng-Yueng Chen, National Chi Nan University, Taiwan; Hsiuping Institute of Technology, Taiwan; Wen-Shiung Chen<sup>2</sup>, National Chi Nan University, Taiwan; Chun-Chuan Yang<sup>1</sup>, National Chi Nan University, Taiwan; Yi-Hung Huang<sup>3</sup>*

**NET24-4:** Handoff Support for Mobility in Future Wireless MPLS Networks: A Proposal and Analysis

*Rami Langar, GET-Telecom Paris, France; Nizar Bouabdallah, INRIA, France; Samir Tohmé*

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## **NET25: MOBILITY MANAGEMENT II**

**Session Chair:** *D. Kim, Kyungpook National University*

**NET25-1:** Mobile IP Use of Private Addresses in an RSIP Home Network

*Jin Tang, Georgia Institute of Technology, USA; John A. Copeland, Georgia Institute of Technology, USA*

**NET25-2:** An Experimental Performance Evaluation of the IETF FMIPv6 Protocol over IEEE 802.11 WLANs

*Emil Ivov, Louis Pasteur University, France; Thomas Noel, Louis Pasteur University, France*

**NET25-3:** Efficient End-to-End Mobility Support in IPv6

*Christian Vogt, Universität Karlsruhe, Germany; Mark Doll, Universität Karlsruhe, Germany*

**NET25-4:** Performance Analysis of Enhanced-Mobile IPv6 with Fast Handover over End-to-End TCP

*Byungjoo Park, University of Florida, USA; Sunguk Lee, University of Florida, USA; Haniph Latchman, University of Florida, USA*

**THURSDAY 6 APRIL 2006**  
**16:00-17:30 ROOM N234**

## **NET26: MOBILITY MANAGEMENT III**

**Session Chair:** *Mooi Choo Chuah, Lehigh University, USA*

**NET26-1:** Modeling Environmental Mobility and Its Effect on Network Protocol Stack

*Maneesh Varshney, University of California, Los Angeles, USA; Zhengrong Ji, University of California, Los Angeles, USA; Mineo Takai, University of California, Los Angeles, USA; Rajive Bagrodia, University of California, Los Angeles, USA*

**NET26-2:** Vertical Handoff Initiation Using Road Topology and Mobility Prediction

*F. Ahdi, Sharif University of Technology, Iran; B. H. Khalaj, Sharif University of Technology, Iran*

**NET26-3:** Multi-States-based Hybrid Location Update Strategy in Wireless Communication System

*Goo Yeon Lee, Kangwon National University, Korea; Yong Lee, Samsung Electronics; Zygmunt J. Haas, Cornell University, USA*

**NET26-4:** Dynamic Vertical Handover Control Algorithm for WLAN and UMTS

*Chie Ming Chou, Industrial Technology Research Institute, Taiwan; ChingYao Huang, National Chiao Tung University, Taiwan*

**MONDAY 3 APRIL 2006**  
**11:00-12:30 ROOM N234**

## **NET27: WIRELESS SECURITY I**

**Session Chair:** *H. Zhu, ISTAR, Singapore*

**NET27-1:** Management of VoWLAN Security Parameters Using a QoS Tool

*Alexandre Passito, Federal University of Amazonas, Brazil; Arlen Nascimento, Federal University of Amazonas, Brazil; Regeane Aguiar, Federal University of Amazonas, Brazil; Edjair Mota, Federal University of Amazonas, Brazil; Edson Nascimento, Federal University of Amazonas, Brazil; Ilias Biris, Nokia Institute of Technology, Brazil; Eduardo Valentin, Nokia Institute of Technology, Brazil*

**NET27-2:** Resolving WPA Limitations in SOHO and Open Public Wireless Networks

*Chad D. Mano, University of Notre Dame, USA; Aaron Striegel, University of Notre Dame, USA*

**NET27-3:** A Novel Classification Scheme for 802.11 WLAN Active Attacking Traffic Patterns

*Wenzhe Zhou, Queen's University, UK; Alan Marshall, Queen's University, UK; Qiang Gu, Queen's University, UK*

**NET27-4:** Turing Assessor: A New Tool for Cyber Security Quantification

*Huafei Zhu, Institute for Infocomm Research, Singapore; Chunxiao Tricia Chigan, Michigan Technological University, USA; Feng Bao, Institute for Infocomm Research, Singapore*

**THURSDAY 6 APRIL 2006**  
**14:00-15:30 ROOM N234**

## **NET28: WIRELESS SECURITY II**

**Session Chair:** *J. Kong, UCLA, USA*

**NET28-1:** GMSP: A Generalized Multi-hop Security Protocol for Heterogeneous Multi-hop Wireless Network

*Bin Xie, University of Louisville, USA; Anup Kumar, University of Louisville, USA; S. Srinivasan, University of Louisville, USA; Dharma Prakash Agrawal, University of Cincinnati, USA*

**NET28-2:** Distributed Multicast Group Security Architecture for Mobile Ad Hoc Networks

*Jiejun Kong, University of California, Los Angeles, USA; Yeng-zhong Lee, University of California, Los Angeles, USA; Mario Gerla, University of California, Los Angeles, USA*



# WCNC 2006 TECHNICAL SESSIONS

## NETWORK LAYER

**NET28-3:** Performance Evaluation of Anonymous Routing Protocols in MANETs

*Jun Liu, University of Alabama, USA; Jiejun Kong, University of California, Los Angeles, USA; Xiaoyan Hong, University of Alabama, USA; Mario Gerla, University of California, Los Angeles, USA*

**NET28-4:** Efficient Key Tree Construction for Group Key Agreement in Ad Hoc Networks

*Zhiguo Wan, National University of Singapore, Singapore; Bo Zhu, George Mason University, USA; Robert H. Deng, Singapore Management University, Singapore; Feng Bao, Institute for Infocomm Research, Singapore; Akkihebbal L. Ananda, National University of Singapore, Singapore*

**TUESDAY 4 APRIL 2006**  
**16:00-17:30 ROOM N236**

### **NET29: WIRELESS SECURITY III**

**Session Chair:** TBA

**NET29-1:** The Effects of Probabilistic Key Management on Secure Routing in Sensor Networks

*Patrick Traynor, The Pennsylvania State University, USA; Guohong Cao, The Pennsylvania State University, USA; Tom La Porta, The Pennsylvania State University, USA*

**NET29-2:** Authentication of Sensor Network Flooding Based on Neighborhood Cooperation

*Tong Zhou, Duke University, USA; Krishnendu Chakrabarty, Duke University, USA*

**NET29-3:** Policy-driven Physical Attacks in Sensor Networks: Modeling and Measurement

*Xun Wang, The Ohio State University, USA; Sriram Chellappan, The Ohio State University, USA; Wenjun Gu, The Ohio State University, USA; Wei Yu, Texas A&M University, USA; Dong Xuan*

**NET29-4:** Resilient Against Report Fabrication Attack in Clusters of Heterogeneous Sensor Networks

*Miao Ma, Institute for Infocomm Research, Singapore*

**TUESDAY 4 APRIL 2006**  
**9:00-10:30 ROOM N233**

### **NET30: WIRELESS MULTICAST**

**Session Chair:** I. Rubin, UCLA, USA

**NET30-1:** Macro Diversity Combining Techniques for Multimedia Broadcast/Multicast Services in UMTS Networks

*Armando Soares, ADETTI, Portugal; Américo Correia, ADETTI, Portugal*

**NET30-2:** Multicasting in Sparse MANETs Using Message Ferrying

*Yang Chen, Georgia Institute of Technology, USA; Jeonghwa Yang, Georgia Institute of Technology, USA; Wenrui Zhao, Georgia Institute of Technology, USA; Mostafa Ammar, Georgia Institute of Technology, USA; Ellen Zegura, Georgia Institute of Technology, USA*

**NET30-3:** HVE-Mobicast: A Hierarchical-Variant-Egg-based Mobicast Routing Protocol for Wireless Sensornets

*Yuh-Shyan Chen, National Chung Cheng University, Taiwan; Yi-Jiun Liao, National Chung Cheng University, Taiwan*

**NET30-4:** Multicasting in Mobile Backbone based Ad Hoc Wireless Networks

*Choo-chin Tan, University of California, Los Angeles, USA; Izhak Rubin, University of California, Los Angeles, USA; Huei-jiun Ju, University of California, Los Angeles, USA*

**MONDAY 3 APRIL 2006**  
**16:00-17:30 ROOM N233**

### **NET31: CROSS LAYER DESIGN**

**Session Chair:** TBA

**NET31-1:** Mobility-Location Aided Transmission Aware MAC Enhancements for Ad Hoc Networks

*Kirtimaan Rajshiva, University of Cincinnati, USA; Qing-An Zeng, University of Cincinnati, USA*

**NET31-2:** Cross-Layer Inference-based Fast Link Error Recovery for MANETs

*Justin Yackoski, University of Delaware, USA; Chien-Chung Shen, University of Delaware, USA*

**NET31-3:** Link Level Aspects Modelling in the Simulation of Packet Switched Wireless Networks

*Luca Zuliani, Teleca Italia S.p.A., Italy; Claudio Gambetti, Siemens, Italy; Alberto Zanella, National Research Council, Italy; Oreste Andrisano, National Research Council, Italy*