

# ADHOCNETS 2010

Aug. 18-20, 2010, Victoria, BC, Canada



## TECHNICAL PROGRAM

### First International Conference on Ad Hoc Networks

August 18-20, 2010, Victoria, British Columbia, Canada

<http://www.adhocnets.org/>



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## MESSAGE FROM GENERAL CHAIR



Welcome to AdHocNets 2010, the Second International Conference on Ad Hoc Networks! The 2010 AdHocNets conference will be held on August 18-20 in Victoria, British Columbia, Canada. Following the successful inaugural AdHocNets conference held in Niagara Falls, Ontario, the 2010 conference continues to provide a forum for the latest developments in all aspects of ad hoc networks. On behalf of the Organizing Committee, I extend a warm welcome to participants from industry and academia to join us for three exciting days of stimulating technical presentations and discussions.

Our Technical Program Committee co-chaired by Profs. Jun Zheng and David Simplot-Ryl has assembled a top-notch technical program, which features keynote presentations by two world renowned leaders in the field, Prof. Mario Gerla of UCLA and Dr. Arthur Astrin, Chair of IEEE 802.15 TG6 (Body Area Network), as well as several invited presentations from top researchers in the field. Participants will undoubtedly benefit from the wisdom and insights of these stalwarts of academic and industrial research. All participants are invited to participate in a technical panel session focusing on commercialization of ad hoc network technology and the steps required to see ad hoc network technology widely adopted.

Victoria, the host city for the 2010 AdHocNets conference, is the capital of the Province of British Columbia in Canada and is located at the southern tip of Vancouver Island. Victoria boasts many historic buildings and some of the most fascinating museums in Western Canada. The city benefits from one of Canada's mildest climates, which allows its residents to pursue outdoor pleasures all year round. Victoria enjoys some of the country's most exhilarating scenery: there is an ocean or mountain vista around every corner, while the city's flower gardens are famous the world over. Participants are invited to bring their families and take their time before and after the conference to enjoy the city of Victoria and the beautiful Canadian province of British Columbia.

On behalf of the Organizing Committee of AdHocNets 2010, we thank the authors who have submitted their papers and contributed their recent research results to this conference, all the TPC members and reviewers for volunteering their valuable time and efforts, and the strong support of the Steering Committee and the ICST staff. The conference is organized under the sponsorship of ICST and CREATE-NET.

We look forward to welcoming you in person at AdHocNets 2010!

Victor C. M. Leung

AdHocNets 2010 General Chair

# KEYNOTE ADDRESS I

## Vehicular Urban Sensing: Techniques and Applications



### Professor Mario Gerla

University of California at Los Angeles, USA

#### Abstract

There has been growing interest in vehicle to vehicle communications for a broad range of applications ranging from safe driving to content distribution, advertising, commerce and games. One relatively new application is urban sensing. Vehicles monitor the environment, classify the events, e.g., license plates, pollution readings, etc. and exchange metadata with neighbors in a peer-to-peer fashion, creating a distributed index from which mobile users can extract different views. For instance, the Department of Transportation captures traffic statistics; the Department of Health monitors pollutants, and; Law Enforcement Agents investigate crimes. Mobile, vehicular sensing differs radically from conventional, static sensor operations. Vehicles have abundant battery life, processing power and storage capacity. Moreover, as they move, they continually generate new data, making conventional sensor data collection techniques inadequate. In this talk we first review promising urban sensing applications; then, we introduce MobEyes, a middleware solution that works for all applications and that, via diffusion of data summaries, creates a distributed index of the sensed data. We discuss various techniques to design and maintain such a distributed index. We propose the use of bioinspired approaches to harvest the index. Finally, we address the issues of privacy of dissemination and of harvesting.

#### Biography

Dr. **Mario Gerla** is a Professor in Computer Science at University of California at Los Angeles (UCLA), USA. He holds an Engineering degree from Politecnico di Milano, Italy and the Ph.D. degree from UCLA. He became IEEE Fellow in 2002. At UCLA, he was part of the team that developed the early ARPANET protocols under the guidance of Prof. Leonard Kleinrock. He joined the UCLA Faculty in 1976. At UCLA, he has designed and implemented network protocols

including ad hoc wireless clustering, multicast (ODMRP and CODECast) and Internet transport (TCP Westwood). He has lead the \$12M, 6 year ONR MINUTEMAN project, designing the next generation scalable airborne Internet for tactical and homeland defense scenarios. He is now leading two advanced wireless network projects under ARMY and IBM funding. His team is developing a Vehicular Testbed for safe navigation, urban sensing and intelligent transport. A parallel research activity explores personal communications for cooperative, networked medical monitoring (see [www.cs.ucla.edu/NRL](http://www.cs.ucla.edu/NRL) for recent publications).

## **KEYNOTE ADDRESS II**

### **Standardization of the Body Area Network (BAN)**



**Dr. Arthur Astrin**

Chair, IEEE 802.15 TG6, USA

#### **Abstract**

Body Area Networks (BAN) devices operate in close vicinity to, on, or inside body and can enable a wide range of applications, including medical support, healthcare monitoring and consumer electronics with increased convenience or comfort. Due to strong demands of medical, healthcare and information technology industries, IEEE was requested to standardize the Body Area Network. IEEE 802.15 task group 6 (TG6) was set up to develop an IEEE international standard for BAN in January 2008. This talk reviews major issues, history and current status of TG6. Early on, the TG6 invited representatives from industry to present applications which require body area networks. We then developed an application matrix, and summarized it into a single document, which was issued to proposers. The proposers were asked to propose a communication protocol that would accommodate this application summary document. The other issue facing TG6 was to have a detail understanding of available spectrum for BANs. And finally we needed at an accurate model of the channel; in this case the human body. This channel is much more difficult than free space/air to measure and to correctly model. The first draft of the standard started letter ballot on May 31, 2010 and we expect comments resolution in the next IEEE 802 meeting in July 2010 in San Diego.

## Biography

Dr. **Arthur W. Astrin** received the Ph.D. E.E. from U.C.L.A. in Communication Engineering in 1984. He has worked for Apple Computer, Inc., IBM (100% club), Siemens, ROLM, Memorex and Citicorp in technical and management positions, where he developed several computer and communication systems. At Apple, he assisted in birthing the Wi-Fi industry, delivering first consumer oriented, wireless solution to the PC industry – AirPort, as well as creating industry compatibility with the Wi-Fi testing organization. In 1969 he built world’s first DSP and hardware FFT processor. He also has been a professor at SJSU and UC Berkeley, teaching communication and computer engineering. Keeping one foot in academic world has allowed him to work on theoretical engineering problems, such as coexistence of Bluetooth and Wi-Fi wireless communications, as well as mentoring many students into the Silicon Valley industry. He is the Chair of the IEEE Information Theory Group in Santa Clara, a recipient of the IEEE Third Millennium Medal and a Senior Member of IEEE. He was a member of Bluetooth SIG and has been a member of IEEE 802.11/15 standards committee since 1997. He currently chairs the Body Area Network Task Group 6 of IEEE 802.15. Dr. Astrin has seven patents and one in the process.

# TECHNICAL PROGRAM AT A GLANCE

## [Wednesday, August 18 2010](#)

08:00am - 05:00pm Registration  
08:45am - 09:00am Welcome and Opening Addresses  
09:00am - 10:00am Keynote Speech I  
10:00am - 10:30am Coffee Break  
10:30am - 12:00pm Session 1: Ad Hoc Network Design I  
12:00pm - 02:00pm Lunch  
02:00pm - 03:30pm Session 2: Routing  
03:30pm - 04:00pm Coffee Break  
04:00pm - 05:30pm Session 3: Ad Hoc Network Design II

## [Thursday, August 19 2010](#)

08:00am - 05:00pm Registration  
09:00am - 10:00am Keynote Speech II  
10:00am - 10:30am Coffee Break  
10:30am - 12:00pm Session 4: Panel  
12:00pm - 02:00pm Lunch  
02:00pm - 03:30pm Session 5: Medium Access Control  
03:30pm - 04:00pm Coffee Break  
04:00pm - 05:30pm Session 6: Tracking and Routing  
07:00pm - 10:00pm Gala Dinner

## [Friday, August 20 2010](#)

08:00am - 05:00pm Registration  
09:00am - 10:30am Session 7: Network Security and Reliability  
10:30am - 10:45am Coffee Break  
10:45am - 12:00pm Session 8: Clustering and Node Placement  
12:00pm - 02:00pm Lunch  
02:00pm - 03:30pm Session 9: Performance Analysis and Evaluation I  
03:30pm - 04:00pm Coffee Break  
04:00pm - 05:30pm Session 10: Performance Analysis and Evaluation II

# TECHNICAL PROGRAM

## Wednesday, August 18 2010

Wednesday, August 18 2010 08:00am - 05:00pm

Room: Salon A

**Registration**

Wednesday, August 18 2010 08:45am - 09:00am

Room: Salon A

**Welcome and Opening Address**

Prof. Victor C. M. Leung, University of British Columbia, Canada

Wednesday, August 18 2010 09:00am - 10:00am

Room: Salon A

**Keynote Talk I: Vehicular Urban Sensing: Techniques and Applications**

Prof. Mario Gerla, University of California at Los Angeles, USA

10:00am - 10:30am

**Coffee Break**

Wednesday, August 18 2010 10:30am - 12:00pm

Room: Salon A

**Session 1: Ad Hoc Network Design I**

Chair: John N. Daigle, University of Mississippi, USA

**1. Towards Autonomous Vehicular Clouds (Invited Paper)**

M. Eltoweissy, S. Olariu, and M. Younis, Old Dominion University, USA

**2. Ad Hoc Networks and Mobile Devices in Emergency Response - a Perfect Match? (Invited Paper)**

E. G. Nilsson and K. Stølen, University of Oslo, Norway

**3. Sensorium - An Active Monitoring System for Neighborhood Relations in Wireless Sensor Networks**

S. Nurnberger, R. Karnapke, and J. Nolte, Brandenburg University of Technology Cottbus, Germany

**4. Cashflow: A Channel-Oriented, Credit-Based Virtual Currency System for Establishing Fairness in Ad-Hoc Networks with Selfish Nodes**

L. Wallentin, J. Fabini, C. Egger, and M. Happenhofer, Vienna University of Technology, Austria

12:00pm - 02:00pm

**Lunch: Salon B**

**Wednesday, August 18 2010 02:00pm - 03:30pm**

**Room: Salon A**

**Session 2: Routing**

Chair: Chung-Horng Lung, Carleton University, Canada

**1. Location Management in Heterogeneous VANETs: A Mobility Aware Server Selection Method (Invited Paper)**

S. Hosseininezhad and V. C.M. Leung, University of British Columbia, Canada

**2. Insights into Routing Stability of a Wireless Testbed (Invited Paper)**

M. Bezahaf, L. Iannone, M. D. de Amorim, and S. Fdida, Université Pierre et Marie Curie, France

**3. A Study of Adaptive Gossip Routing in Wireless Mesh Networks**

B. Blywis, M. Günes, S. Hofmann, and F. Juraschek, Freie Universität Berlin, Germany

**4. A Multipath Routing Method with Dynamic ID for Reduction of Routing Load in Ad Hoc Networks**

T. Okazaki, E. Kohno, T. Ohta, and Y. Kakuda, Hiroshima City University, Japan

**03:30pm - 04:00pm**

**Coffee Break**

**Wednesday, August 18 2010 04:00pm - 05:30pm**

**Room: Salon A**

**Session 3: Ad Hoc Network Design II**

Chair: Ketil Stølen, University of Oslo, Norway

**1. Cooperative Spectrum Sensing in Ad Hoc Networks (Invited Paper)**

L. Gavrilovska and V. Atanasovski, Institute of Telecommunications, Public of Macedonia

**2. Receiver Sensitivity in Opportunistic Cooperative Internet of Things (IoT) (Invited Paper)**

V. M. Rohokale, N. R. Prasad, and R. Prasad, Aalborg University, Denmark

**3. Event Detection in Wireless Sensor Networks - Can Fuzzy Values Be Accurate?**

K. Kapitanova, S. H. Son, University of Virginia, USA; K.-D. Kang, Binghamton University, USA

**4. Terminal Design without using Receiver Circuits for Wireless Sensor Networks**

H. Nose, Nagano Prefectural Institute of Technology, Japan; M. Bao, Shinshu University, Japan; K. Mizuta, Epson Toyocom Corporation, Japan; Y. Yoshikawa, Seiko Epson Corporation, Japan; H. Kunimune, M. Niimura, and Y. Fuwa, Shinshu University, Japan

**Thursday, August 19 2010**

**Thursday, August 19 2010 08:00am - 05:00pm**

**Room: West Ballroom**

**Registration**

**Thursday, August 19 2010 09:00am - 10:00am**

**Room: West Ballroom**

**Keynote Talk II: Standardization of the Body Area Network (BAN)**

Dr. Arthur Astrin, Chair, IEEE 802.15 TG6, USA

**10:00am - 10:30am**

**Coffee Break**

**Thursday, August 19 2010 10:30am - 12:00pm**

**Room: West Ballroom**

**Session 4 (Panel):**

**Panel Topic: Commercialization of Ad Hoc Network Technology**

Panel Moderator: Prof. Dave Michelson, UBC

Industry Panelists: Dr. Arthur Astrin, Chair, IEEE 802.15 TG6, USA  
Dr. Ketil Stølen, Chief Scientist, SINTEF ICT, Norway  
Dr. Brad Lowe, Waterfront Wireless Communication Center, Canada

University Panelists: Prof. John N. Daigle, The University of Mississippi, USA  
Prof. Stephan Olariu, Old Dominion University, USA

**12:00pm - 02:00pm**

**Lunch: West Ballroom**

**Thursday, August 19 2010 02:00pm - 03:30pm**

**Room: West Ballroom**

**Session 5: Medium Access Control**

Chair: Stephan Olariu, Old Dominion University, USA

- 1. An Efficient Geo-Routing Aware MAC Protocol for Underwater Sensor Networks (Invited Paper)**  
Y. Zhu, Z. Zhou, P. Zheng, and J.-H. Cui, University of Connecticut, USA
- 2. A Decentralized Scheduling Algorithm for Time Synchronized Channel Hopping (Invited Paper)**  
A. Tinka, T. Watteyne, K. Pister, University of California at Berkeley, USA
- 3. DCLA: A Duty-Cycle Learning Algorithm for IEEE 802.15.4 Beacon-Enabled WSNs**  
R. de Paz and D. Pesch, Cork Institute of Technology, Ireland
- 4. Collision-Free Routing Centralized Scheduling using EbMR-CS Algorithm for IEEE 802.16 Mesh Networks**  
Y. A. Qasem, A. Z. Alhemyari, C. K. Ng, N. K. Noordin, and O. M. Ceesay, Universiti Putra Malaysia, Malaysia

**03:30pm - 04:00pm**

**Coffee Break**

**Thursday, August 19 2010 04:00pm - 05:30pm**

**Room: West Ballroom**

**Session 6: Tracking and Routing**

Chair: Liljana Gavrilovska, Institute of Telecommunications, Macedonia

- 1. Energy-Efficient Target Tracking in Wireless Sensor Networks**  
L. Arienzo, Institute for the Protection and Security of the Citizen, Italy; M. Longo, University of Salerno, Italy
- 2. QoS for Wireless Sensor Networks: Tackling Service Differentiation at the MAC Sub-Layer**  
B. Nefzi and Y.-Q. Song, LORIA - Nancy University INPL, France
- 3. Mobility and Traffic Adapted Cluster Based Routing for Mobile Nodes (CBR-Mobile) Protocol in Wireless Sensor Networks**  
S. A. B. Awwad, C. K. Ng, N. K. Noordin, M. Fadlee, A. Rasid, and A.R.H. Alhawari, Universiti Putra Malaysia, Malaysia
- 4. Quantifying the Negative Impact of Mobility & Location Service Inaccuracy on Geo-Routing in Urban Vehicular Environments**  
A. O' Driscoll and D. Pesch, Cork Institute of Technology, Ireland

**07:00pm - 10:00pm**

**Gala Dinner: Salon B**

**Friday, August 20 2010**

**Friday, August 20 2010 08:00am - 05:00pm**

**Room: West Ballroom**

**Registration**

**Friday, August 20 2010 09:00am - 10:30am**

**Room: West Ballroom**

**Session 7: Network Security and Reliability**

Chair: Mohamed Eltoweissy, Pacific Northwest National Laboratory, USA

- 1. Establishing Trust on VANET Safety Messages (Invited Paper)**  
S. Biswas and J. Mistic, Ryerson University, Canada
- 2. Accelerating Signature-Based Broadcast Authentication for Wireless Sensor Networks**  
X. Fan and G. Gong, University of Waterloo, Canada
- 3. Secure Data Aggregation in Wireless Sensor Networks: Homomorphism versus Watermarking Approach**  
J. M. Bahi, C. Guyeux, and A. Makhoul, University of Franche-Comté (LIFC), France
- 4. Guaranteeing Reliable Communications in Mesh Beacon Enabled IEEE802.15.4 WSN for Industrial Monitoring Applications**  
B. C. Villaverde, S. Rea, and D. Pesch, Cork Institute of Technology, Ireland

**10:30am - 10:45am**

**Coffee Break**

**Friday, August 20 2010 10:45am - 12:00pm**

**Room: West Ballroom**

**Session 8: Clustering and Node Placement**

Chair: Arunita Jaekel, University of Windsor, Canada

- 1. A Tree-Based Multiple-Hop Clustering Protocol for Wireless Sensor Networks**  
Y. Jiang, C.-H. Lung, Carleton University, Canada; N. Goel, Cistel Technology, Canada
- 2. Evaluation of Wireless Body Area Sensor Placement for Mobility Support in Healthcare Monitoring Systems**  
S. González-Valenzuela, University of British Columbia, Canada; M. Chen, Seoul National University, Republic of Korea; V. C.M. Leung, University of British Columbia, Canada
- 3. Optimal Relay Node Placement and Trajectory Computation in Sensor Networks with Mobile Data Collector**  
A. Bari, F. Luo, W. Froese, and A. Jaekel, University of Windsor, Canada
- 4. Balanced Itinerary Planning for Multiple Mobile Agents in Wireless Sensor Networks**  
M. Chen, W. Cai, Seoul National University, Republic of Korea; S. Gonzalez, V. C.M. Leung, University of British Columbia, Canada

**12:00pm - 02:00pm**

**Lunch: West Ballroom**

**Friday, August 20 2010 02:00pm - 03:30pm**

**Room: West Ballroom**

**Session 9: Performance Analysis and Evaluation I**

Chair: Min Chen, Seoul National University, Republic of Korea

- 1. Analytical Modeling of Address Allocation Protocols for Wireless Ad Hoc Networks (Invited)**  
A. Radaideh and J. N. Daigle, University of Mississippi, USA
- 2. Analysis of One-Hop Packet Delay in MANETs over Distributed Coordination Function of IEEE 802.11**  
J. Li, Y. Zhou, L. Lamont, Communications Research Centre, Canada; C.-A. Rabbath, Defense Research and Development Canada Valcartier, Canada
- 3. Performance of Packet-Based Frequency-Hopping Spread Spectrum Radio Control Systems**  
A. Ismail, I. Lambadair, C.-H. Lung, Carleton University, Canada; N. Goel, Cistel Technology, Canada
- 4. Performance Analysis of UWB Body Sensor Networks for uses in Medical Applications**  
A. Chehri and H. T. Mouftah, University of Ottawa, Canada

**03:30pm - 04:00pm**

**Coffee Break**

**Friday, August 20 2010 04:00pm - 05:30pm**

**Room: West Ballroom**

**Session 10: Performance Analysis and Evaluation II**

Chair: Jun Li, Communications Research Center, Canada

- 1. A Vehicle-to-Vehicle Communication Protocol for Collaborative Identification of Urban Traffic Conditions**  
Øyvind Risan (Norwegian University of Science and Technology, Norway) and Evtim Peytchev (Nottingham Trent University, United Kingdom)
- 2. A Practical Evaluation of ZigBee Sensor Networks for Temperature Measurement**  
A. Chehri and H. T. Mouftah, University of Ottawa, Canada
- 3. Minimum Total Node Interference in Wireless Sensor Networks**  
N. X. Lam, T. N. Nguyen, and D. T. Huynh, University of Texas at Dallas, USA
- 4. Reproducing Consistent Wireless Protocol Performance across Environments**  
T. Kwon, E. Ertin, and A. Arora, The Ohio State University Columbus, USA

## **TECHNICAL PROGRAM COMMITTEE**

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