

**CERIES**Tohoku University Electro-Related Departments
Global COE Program*Center of Education and Research for Information Electronics Systems*

GCOE Special Lecture Series on

How to Write Academic Papers and Introduction of Applied Algorithms

Date: 12 October, 2010 10:00 to 16:00

Place: Conference Room 103, Research Building No.1,

Electrical, Information, and Physics Engineering

Lecturer: Professor Ivan Stojmenovic, University of Ottawa, Canada

www.site.uottawa.ca/~ivan

Title and Abstract:

10:00 – 12:00

1. How to Write Articles in Computer Science and Related Engineering Disciplines

This talk advocates a general way of presenting research articles on any topic and in any field related to computer science, information technology, and relevant engineering disciplines. Some examples and implications are given for the case study of wireless sensor networks. The key advice to a successful presentation is to repeat the description of main contribution four times: in the title, abstract, introduction (or chapter 1) and in the text. That is, make readable, appealing, and as complete as possible versions of the work using the order of 10, 100, 1000 and 10.000 words. This corresponds to the decreasing portion of readers for corresponding parts of the article. To the extent possible, each of these parts should address, in this order: the problem statement, existing solutions, the new solution(s), assumptions and limitations, analysis, simulation and comparison with best competing solutions.

2. Contribution of Applied Algorithms to Applied Computing

There are many attempts to bring together computer scientists, applied mathematician and engineers to discuss advanced computing for scientific, engineering, and practical problems. This talk is about the role and contribution of applied algorithms within applied computing. It will discuss some specific areas where design and analysis of algorithms is believed to be the key ingredient in solving problems, which are often large and complex and cope with tight timing schedules. The talk is based on recent Handbook of Applied Algorithms (Wiley, March 2008), co-edited by the speaker. The featured application areas for algorithms and discrete mathematics include computational biology, computational chemistry, wireless networks, Internet data streams, computer vision, and emergent systems. Techniques identified as important include graph theory, game theory, data mining, evolutionary, combinatorial and cryptographic, routing and localized algorithms.

14:00 – 16:00

3. Vehicular Ad Hoc Networks and Integrated Intelligent Transportation Systems

This talk reviews the components and algorithmic challenges of intelligent transportation systems: dynamic route selection, environmentally friendly driving, dynamic traffic light scheduling problem, reconfiguration of road network and traffic admission control, congestion modeling and forecast, and effective incentive and enforcement policies. ITS also includes vehicle-to-vehicle communication, with associated problems such as geocasting for congestion notification, vehicle to vehicle routing, and enabling application services for user devices. State of the art protocols for automotive networking and communication are described.

4. Data Dissemination and Routing in Vehicular Ad Hoc Networks

This talk reviews recent vehicle-to-vehicle communication protocols, with the emphasis on protocols addressing intermittent connectivity of vehicular ad hoc networks (VANET). Data dissemination enables congestion notification (among others) and is based on tasks such as diffusion and broadcasting to a region (geocasting), which rely on single-hop and multi-hop inter-vehicle communications, respectively. Vehicle to vehicle routing enables application services for user devices via multi-hopping to roadside units, and direct communication among vehicles. Common issues in VANET routing are discussed.

Biography

Ivan Stojmenovic received his Ph.D. degree in mathematics in 1985. He earned a third degree prize at the International Mathematics Olympiad for high school students in 1976. He held regular or visiting positions in Serbia (Institute of Mathematics, University of Novi Sad, 1980-1987), Japan (Electrotechnical Laboratory, Tsukuba, 1985/6), USA (Washington State University, Pullman, WA, and University of Miami, FL, 1987/88), France (Amiens 1998, Lille 2002-2007, Paris 2008), Mexico (DISCA, IIMAS, Universidad Nacional Autonoma de Mexico, 2000/02), Spain (Murcia, 2005), UK (Chair in Applied Computing, EECE, University of Birmingham, 2007/8), Canada (SITE, University of Ottawa, since 1988). He published >250 different papers in referred journals and conferences; >80 of them are in journals with an ISI impact factor, >20 are in IEEE or ACM journals. He (co)edited four books with Wiley: 'Handbook of Wireless Networks and Mobile Computing' (2002), 'Mobile Ad Hoc Networking' (IEEE/Wiley, 2004), 'Handbook of Sensor Networks: Algorithms and Architectures'(2005), 'Handbook of Applied Algorithms: Solving Scientific, Engineering and Practical Problems' (2008). His most significant publications can be seen at www.site.uottawa.ca/~ivan. He co-authored over 30 book chapters, mostly very recent. He collaborated with about 100 co-authors with Ph.D. and a number of their graduate students from 24 different countries. He (co)supervised 50 completed Ph.D. and master theses, and published over 120 joint articles with supervised students. His current research interests are mainly in wireless ad hoc, sensor and cellular networks. His research interests also include parallel computing, multiple-valued logic, evolutionary computing, neural networks, combinatorial algorithms, computational geometry, graph theory, computational chemistry, image processing, programming languages, and computer science education. He was cited >3500 times and is in the top 0.56% most cited authors in Computer Science (Citeseer August 2006). One of his articles, on broadcasting in ad hoc wireless networks, was recognized as the **Fast Breaking Paper**, for October 2003 (as the only one for all of computer science), by *Thomson ISI Essential Science Indicators* <http://esi-topics.com/fbp/fbp-october2003.html>. He received: **Best Paper Award**, at the IFIP PWC, 2004 and SENSORCOMM 2007; **Faculty of Engineering's 2004-2005 Award for Excellence in Research, University of Ottawa**; NSERC Collaborative Research Development (CRD) project (2005-8), and NSERC Strategic Grant (2006-9) as Principal Investigator. He presented several tutorials on ad hoc and sensor networks, and gave a number of invited talks. He was Director of the Ottawa-Carleton Institute for Computer Science (2002-2004). He is recipient of the **Royal Society Research Merit Award, UK**, from 2007. He is elected to **IEEE Fellow** status by Communication Society, from 2008.