



IRI 2006 Panel: Funding Opportunities in Information Reuse and Systems Engineering

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Communication Networks Laboratory

- **Communication networks:**
 - performance analysis of high-performance packet networks
 - simulation of protocols, connection admission, scheduling, and congestion control algorithms
 - traffic collection, characterization, and modeling
 - intelligent control of communication systems



Communication Networks Laboratory

- **Projects**
 - **DAWN**: data analysis of wireline/wireless networks
 - **ICON**: intelligent control of networks
 - **SIMON**: simulation of networks
 - Various projects
 - OPNET-specific projects



Communication Networks Laboratory

■ **SIMON**: simulation of networks

- Improving the Performance of the Gnutella Network
- BGP Route Flap Damping Algorithms
- BGP with an Adaptive Minimal Route Advertisement Interval
- Implementation of BGP in a Network Simulator
- Selective-TCP for wired/wireless networks
- TCP over wireless networks
- Modeling and performance evaluation of a General Packet Radio Services (GPRS) network using OPNET
- Simulation of General Packet Radio Services (GPRS) network system using OPNET
- Traffic engineering prioritized IP packets over Multi-Protocol Label Switching (MPLS) network
- OPNET modeling and simulation of QoS aware medium access control (MAC) in wireless ad hoc networks
- Implementation and performance simulation of VirtualClock scheduling algorithm in IP networks
- Simulation of quality of service parameters in IP networks
- OPNET modeling and simulation of CDPD MAC layer behavior
- OPNET modeling and simulation of Deficit Round Robin scheduling algorithm for IP networks



Funding sources in Canada

- Canadian Federal Granting Agencies (included NSERC):
 - National Science and Engineering Research Council (NSERC): similar to National Science Foundation (NSF) in USA
 - Canada Foundation for Innovation:
 - New Opportunities
 - Major Infrastructure Funds: SFU IRMACS
- Federal Networks and Centres of Excellence
- Government: Canadian Research Chairs: tier I and tier II
- Provincial support:
 - British Columbia Ministry of Advanced Educations: Knowledge Discovery Fund
 - Alberta: iCore and Ingenuity funds



Funding sources in Canada

- University support for new faculty:
 - departmental start up funding for new faculty
 - \$ 50,000 to \$ 100,000 CND
 - other funding:
 - SFU President fund: \$ 10,00 CND
- Industrial support:
 - collaboration with private-sector partners: local R&D and industrial laboratories



NSERC funding

- Discovery grants: in the past known as Research, Individual, or Operating grants
- Research tools and instrumentation (RTI) grants: not available every year
- Strategic Projects Grant:
 - collaboration with local industry, joint projects, and in-kind contributions
- National Centers of Excellence: not available every year
- Collaborative Research and Development (CRD) grants:
 - mandatory close collaboration and in-cash contribution from private-sector partners



NSERC Discovery Grants

- Discovery grants: individual grants
 - quality of the researcher
 - quality of the proposal
- Granting period: 4 to 5 (new) years
- Proposal deadline: November 1 of each year
- Intended to support:
 - graduate students and postdoctoral fellows
 - visitors (limited)
 - conference registrations and travel
 - equipment (limited)
- General Selection Committee (GSC) 334:
Communications, Computers & Components Engineering



NSERC Discovery Grants: statistics

- Full proposals (with a strict format to follow)
- High success rate (~90%)
- NSERC grant: ~\$25,000 CND – \$50,000 CND
 - SFU: <http://www.sfu.ca/ors/stats.html>
- Example:
 - 2003/2004 SFU TriCouncils total: \$ 37,654,676 CND



NSERC Discovery Grants: pitfalls

- Funding levels varies and depends on the:
 - yearly NSERC budget set by the government
 - specific area of research and the evaluating committee
 - individual committee members (peer reviews)
- An increase of 50% every 4(5) years indicates a good proposal by a productive faculty member:
 - impact, quality, and number of publications
 - number of trained high quality personnel (HQP): postdoctoral fellows, Ph.D., M.Sc., and undergraduate students



Shortage of funding

- Considerable funding is available for establishing infrastructure: equipment and lab space
- No overhead charge by Universities (SFU)
- Very limited finding for supporting graduate students:
 - NSERC guidelines:
 - Ph.D. and M.Sc. students: \$ 16,500 CND
 - Postdoctoral fellows: \$ 35,000 CND
- In most smaller universities (such as SFU) there is very limited funding for graduate students and research collaboration:
 - funding levels are even more limited for foreign students



Funding agencies: trends

- Across organizations: universities and private-sector
- Across university campuses
- Cross disciplinary: engineering/computing science/medicine
- New and emerging fields:
 - biomedical engineering
 - circuits and systems
 - communications



Funding new and emerging fields

- biomedical engineering:
 - human genome and genetics
 - pharmaceutical advances
- circuits and systems:
 - nanotechnologies
 - bio-inspired circuits and systems
- communications:
 - connectivity
 - performance (quality of service, quality of experience)
 - security and privacy



Communication Networks Laboratory

- Communication Networks Laboratory:
<http://www.ensc.sfu.ca/cnl>
 - engineering/computing science: Internet protocols
 - engineering/statistics: Internet traffic
 - engineering/control/mathematics: dynamical behavior of Internet as a complex systems
 - International Workshop for Complex Systems and Networks 2006 (IWCSN 2006), August 18–19, SFU:
<http://iwcsn2006.irmacs.sfu.ca>
- Current CNL support:
 - NSERC Discovery grant: \$ 24,850 CND
 - NSERC RTI grant: \$ 57,299 CND



CNL: alumni and current members

M.A.Sc. students:

- Nazy Alborz
- Rob Ballantyne
- Nikola Cackov
- Leo Chen
- Andre Dufour
- Diangling (Tony) Fang
- Michael Jiang
- Maryam Keyvani
- Nenad Lasković
- Savio Lau
- Mingjian (Judy) Liu
- Vladimir Markovski
- Renju Naryanan
- Milan Nikolic
- Modupe Ometi
- Rajashree Paul
- Qing (Kenny) Shao
- Steve Shen
- Duncan Sharp
- James Song
- Bozidar Vujičić
- Svetlana Vujičić
- Vladimir Vukadinović
- Wan Zeng
- Hui (Grace) Zhang



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IRI 2006, Hawaii, USA

17