

**North American Summer School in Information Theory (NASIT)
18-21 June 2014 Toronto, Canada**

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BRIEFING DOCUMENT

Executive Summary:

The IEEE North American Summer School in Information Theory provides a supportive environment where foundations for learning and long-term future scientific collaborations are established. This workshop delivers interactive education for graduate students in the mathematical, engineering, and computer sciences, alongside the opportunity to meet with distinguished lecturers and peers. We are excited to be hosting the 7th annual North American Summer School in Information Theory (NASIT) at the University of Toronto in June of 2014.

Budget & Request for Funding Assistance:

- **2014 cost is estimated to be \$50,000 for 120 students**
- Previous schools have received support from the IEEE Information Theory Society, the NSF, the ARO, the AFOSR, and various other sources of governmental, industrial, and university support. We will be approaching these sources of funding as well as Canadian sources such as the Fields Institute, MITACS, the University of Toronto Connaught Fund, and local industry such as Blackberry and Telus.
- **In 2013 the IT Society contributed \$20,000 to the Summer School held at Purdue. We respectfully request the same amount of support for the 2014 School.**

Organizing committee:

- Lead: Stark Draper, Associate Professor of Electrical and Computer Engineering, University of Toronto, (416) 978-0503; stark.draper@utoronto.ca
- Rest of organizing committee: TBD
- Advisers: Frank Kschischang, Gerhard Kramer, Aylin Yener
- Conference Project Team: TBD, student-driven team will include roles such as those for the 2013 Purdue session - Student Travel and Lodging, Catering/Food Coordinator, Speaker Coordinator, Poster Session, Pre-registration/feedback, On-site check-in, Web Master, Video Recording, – among others like Video Conferencing, Targeted Student Recruitment, etc

Workshop purpose: This will be the seventh year the North American School will be held. The School is designed to provide graduate students with opportunities to:

- Learn from distinguished lecturers in the field who will present long-format (2 1/2 hour) tutorials;
- Participate in a stimulating and inviting forum of scientists;
- Present their own work for feedback and potential collaboration;
- Deepen their connections with the community.

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Scientific Topic: Information Theory studies the transmission, processing, and use of information in many contexts; it draws from and contributes to a large number of disciplines in the mathematical sciences. The areas of study of participants will include engineering, computer science, and mathematics. The types of research topics presented by students, and the tutorial areas discussed by lecturers, will span foundational theory, algorithmic design, and implementation in practice.

Examples of topics discussed in recent schools include:

- Coding theory and practice: algebraic and graph-based
- Communication theory and networks
- Cryptography and data security
- Detection, estimation, and inference
- Information Theory and statistics
- Pattern recognition and learning
- Quantum information theory: communication and computation
- Sequences and complexity
- Signal processing, sparsity and compressed sensing, big data

Event Dates

- **18-21 June 2014** (Wednesday morning through Saturday noon)
- We will hold the School on the above dates to coordinate with the 2014 Workshop on Signal Processing Advances in Wireless Communications (SPAWC) which will be held at the University of Toronto on 15-18 June. We are working with the organizers of that workshop to coordinate housing and publicity so that students can easily take advantage of the co-location and timing of the two events.
- Other conferences in June/July 2014:
 - ICC: 10-14 June (week before)
 - ISIT: 29 June - 4 July (two weeks after)
- The registration deadline will need to be relatively early, considering the need of some participants to secure travel visas for Canada.

Event Location:

- **Fields Institute:** The Fields Institute has accepted our proposal to host the School. The Institute will provide all facilities and administrative support.
- The Fields Institute is located on the University of Toronto Campus, adjacent to the Bahen Center for Information Technology, which houses the ECE, CS, and Math Departments at the University of Toronto. It is a 5-min walk from on-campus housing options in New College. We note that the Fields Institute hosted the 1997 Canadian Workshop on Information Theory (CWIT).
- We are excited at the opportunity to hold this event at the Fields Institute. We hope the name recognition will help us attract a wider set of students which will enrich the workshop experience for all. We also hope to promote interdisciplinary awareness of the Institute's mission and work to a broader community of applied

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mathematicians working in the engineering sciences while at the same time advancing the goals of the IEEE Information Theory Society.

- Host facilities:
 - University of Toronto Engineering:
<http://www.engineering.utoronto.ca/>
 - Fields Institute for Research in the Mathematical Science:
<http://www.fields.utoronto.ca>
 - Bahen Center for Information Technology:
http://en.wikipedia.org/wiki/Bahen_Centre_for_Information_Technology
- Accommodations:
 - New College student summer housing:
<http://ncsummer.newcollege.utoronto.ca/groups/>
 - Trinity College student summer housing (alternate to New College):
<http://web.trinity.utoronto.ca/prospective/residence-dining/summer-residence.html>
 - Fields Institute Accommodations page:
<http://www.fields.utoronto.ca/resources/housing.html#shared>

Outline of proposed program

- The target size of the workshop is 120 participants.
- We wish to acknowledge and build off prior successes, planning sessions that have been a staple of IT SOC summer schools:
 - Distinguished lecturers will present long-format (2 1/2 hour) tutorials
 - Students will present their work in poster sessions. Poster sessions will be prefaced by “one minute madness” sessions in which students pitch their poster topics and results in 60 seconds.
 - Social events and awards.

Proposed budget

- **2014 cost is estimated to be \$50,000 for 120 students**, as 2006-2013 costs (without student travel) have averaged \$400 per student.
- In the past, 75% of the event cost has been subsidized through various sources yielding a registration fee of \$100 per student to cover event costs. Previous schools have received support from the IEEE Information Theory Society, the NSF, the ARO, the AFOSR, and various other sources of governmental, industrial, and university support. We will be approaching these sources of funding as well as Canadian sources such as MITACS.
- In our proposal to the Fields Institute we requested \$4800 as well as the use of their facilities and logistic support. Fields has already approved the use of their facilities and has committed their logistic support. Approval of a financial contribution will go through their regular review process.

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BUDGET SKETCH (detailed budget to be prepared)

| Item | Number | Cost | Total |
|-----------------------------|---------------|----------------------------|----------|
| Student housing | 120 students | \$160 pp (single) | \$19,200 |
| Coffee & lunch | 150 attendees | \$30 pp per day (3.5 days) | \$15,750 |
| Banquet (Chinese) | 150 attendees | \$30 pp | \$4,500 |
| Bits & bobs (e.g., bags) | 120 students | \$8 pp | \$1,000 |
| Lecturer lodging | 6 lecturers | \$700 pp | \$4,200 |
| Lecturer travel | 6 lecturers | \$700 pp | \$4,200 |
| Lecturer / organizer dinner | 15 people | \$100 pp | \$1,500 |
| | | | \$50,350 |

Invited Lecturers:

- We have developed a short list of invited lecturers.

Graduate Student Participants (by application):

- In previous years, the school has openly invited graduate students with an interest in the workshop topics to apply to attend. We anticipate a similar process and will request assistance from the Fields Institute to identify ways to promote this workshop to graduate students beyond the information theory community who may benefit from the experience.
- Additionally, we are requesting assistance from previous organizers (and others) to identify ways to encourage the participation of under-represented groups in our community.

Surveys for workshop evaluation and 2014 planning:

- Survey #1 – previous summer school organizers (European and North American)
- Survey #2 - 2014 registrants who have attended previously
- Survey #3 - There is the potential to survey prior year funding agencies, to ensure their needs are being met by the program as well
- Draft questions – to be refined into separate surveys**

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1. What are the top three things that work well - either about the Summer Schools overall, or about the specific event you were involved in?
2. What are the top three things that could be better – either about the Summer Schools overall, or about the specific event you were involved in?
3. What was the one thing you wish you would have known before organizing the summer school?
4. The Summer School has been refined over the years to have a fairly established agenda and program. Considering your experience and perspective, what would you suggest we..
 - a. Stop doing...
 - b. Start doing...
 - c. Continue doing...
5. We wish to encourage the participation of under-represented groups in our community. Have you seen anything that has worked well? Anything that didn't work well that we should avoid?
6. What innovations (or "extreme ideas") could we bring to the Summer School to better serve... Graduate students?
 - a. Presenters?
 - b. IEEE society and its mission?
7. If we changed just one thing to improve the Summer School– what would it be?