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Fields-MITACS Industrial Problem-Solving Workshop (FMIPW)

HISTORY AND MISSION STATEMENT

Fields Institute for Mathematical Sciences:

Founded in 1992, the Fields Institute plays a central role in “promoting contact and collaboration between professional mathematicians and the increasing number of users of mathematics”. It supports research in pure and applied mathematics and statistics. Thematic programs of international interest, academic workshops, and prizes are organized by the Institute.

Of specific interest to the business community is the Commercial and Industrial Mathematics program. This program seeks to develop synergistic links between mathematicians and industrial partners. Since 2006, the Fields-MITACS Industrial Problem-Solving Workshop (FMIPW) is an intrinsic part of this program.

MITACS

MITACS leads Canada’s effort in the generation, application and commercialization of new mathematical tools and methodologies within a world-class research program. The network initiates and fosters linkages with industrial, governmental, and not-for-profit organizations that require mathematical technologies to deal with problems of strategic importance to Canada.

MITACS helps link academia, industry and the public sector, with a view to developing cutting edge mathematical tools vital to a knowledge-based economy. It sponsors research partnerships, industrial interchanges, workshops, and training programs.

FIELDS-MITACS
INDUSTRIAL PROBLEM-SOLVING
WORKSHOP (FMIPW)
August 11-15, 2008

www.fields.utoronto.ca/FMIPW

Fields-MITACS Industrial Problem-Solving Workshop

WHAT'S IN IT FOR THE PARTICIPATING COMPANY:

The intellectual dedication of many expert problem-solvers during the workshop to the phenomenon of interest to the company yields many benefits. These range from partial or complete solutions to the problem of interest, to long-term collaboration

between the companies and the participating academics. The forum is an informal but intensive opportunity for companies to take advantage of the mathematical and scientific computing expertise of participating researchers.

Often the academic reformulation and solution of the problem enables the company to find inexpensive in-house strategies. Similar workshops in Europe and North America have saved participating companies hundreds of thousands of dollars.



In addition, the academic experts typically use state-of-the-art scientific and technological tools, which may prove useful to the company in other contexts as well.

The workshop also serves as a mechanism for recruitment of talented graduate students; the company sponsors can watch this pool of potential employees in action!

BENEFITS TO THE PARTICIPATING COMPANY:

By bringing your project to the FMIPW you will have an opportunity to meet mathematicians and colleagues from other disciplines who are interested in the solution of industrial problems. At the majority of cases the work done at FMIPW meetings provides a sufficient material for the company to complete the solution process in-house. In particular, you can expect some or all of the following:

- a comprehensive analysis of the problem
- the outline of an approach to the problem's solution - initial modelling and development of solution process
- a new perspective on the problem
- explicit directions for further research work and a detailed technical report discussing
- recommended solution strategies.

WHY DO ACADEMIC EXPERTS PARTICIPATE?

The potential benefits of the FMIPW to professional mathematicians involved are myriad. They range from an exposure to interesting mathematical problems arising outside the confines of academia

to an opportunity to try new scientific tools in novel application areas.

Previous workshops have seen such involvement turn into long-term collaborations, often leading to journal publications and new research directions.

COMMITMENT OF FMIPW:

The Fields Institute and MITACS will provide the academic expertise and infrastructure for this workshop. The recruitment of appropriate faculty and graduate students to best meet the needs of the problems will be done by the Fields Institute.

COMMITMENT OF INDUSTRIAL SPONSORS:

Each participating company contributes a problem with mathematical or statistical content for discussion during the workshop. They also commit a representative to participate in the workshop during the problem-solving phase. The company may sponsor part of the FMIPW through a one-time or ongoing financial contribution.

WHAT THE WORKSHOP IS ABOUT:

OBJECTIVES:

The objective of the FMIPW is to connect industries with faculty, postdocs and graduate students who have expertise in industrial case-studies. This interaction is fostered in the specific context of a problem-solving session over 5 days. The case-studies in question have a significant mathematical or statistical content.

The interaction between industry and academia has many potential benefits for both. Academics learn about interesting potential research problems and find application for their existing tools. Industries get access to some of the most experienced mathematical modelers and problem-solvers on the continent.

Format:

The FMIPW will occur over 5 days. Participants will include around 50-60 academic experts (including mathematicians and statisticians), and experts from industry.

On the first day, the industrial sponsors will present their problem statements. The academic experts will divide into teams of 6-10 people each, with one team assigned to each problem. The teams spend the next 3 days collaborating on solutions to their problem, and present their solution on the final day of the workshop.

DELIVERABLES:

At the end of the week, the academic experts make a presentation consisting of the problem restatement and their solution. This is a summary of results; the teams also prepare reports for the industrial sponsors.

