

IRC KeyNotes



**STRATEGIC CONSTRUCTION
MODELING AND DELIVERY**
INDUSTRIAL RESEARCH CHAIR

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April 2012

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Shaw Conference Center

INDUSTRY PARTNERS

Aecon Industrial Western

Building Trades of Alberta

Capital Power Corporation

Christian Labour Association
of Canada

Construction Owners Association
of Alberta

Merit Contractors Association

Progressive Contractors Association
of Canada

Suncor Energy



Dr. Aminah Robinson Fayek, P.Eng.
NSERC Industrial Research Chair in
Strategic Construction Modeling and Delivery

Message from the Chair

Since joining the University of Alberta more than 15 years ago, I have been privileged to work with many industry partners who see the value in applied academic research in construction. Their efforts have made this province an outstanding place to foster much needed advanced research in the field.

Now, here at the University, because of our industry partners, the Hole School of Construction Engineering houses the largest construction faculty in Canada and has become an internationally recognized centre of excellence for research in construction engineering and management.

Research Program 2012 – 2016

An important and growing field in construction research focuses on advanced intelligent decision support systems. Fuzzy logic, combined with learning approaches such as neural networks and genetic algorithms,

provides a relatively simple and efficient way to develop these systems.

Over the next five years, I hope to take intelligent decision support to the next level and combine the advanced approaches to artificial intelligence into powerful hybrid systems able to solve complex, strategically important problems. By specializing in fuzzy logic and artificial intelligence, the Industrial Research Chair (IRC) will be able to develop applications that respond to the dynamic uncertainties and complex interacting factors that characterize construction.

The Power of The IRC's Research Consortium

In a *Globe & Mail* special report on "Collaborative R&D" published on March 25, 2011, Dr. Suzanne Fortier, President of NSERC, commented that a tripartite model of

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Ernie Tromposch: Enjoying the Best of Both Worlds

We asked Ernie Tromposch, Chair of our IRC Management Advisory Committee, what it was like, five years ago, to jump into the realm of academic research and fuzzy logic.

Ernie appreciates life at high altitudes. He flew search and rescue for 23 years and still disappears into the clouds in one of his three planes each summer, headed for fishing, beautiful scenery, and interesting characters in the Yukon. A long-time director and past-president of the Construction Owners Association of Alberta (COAA), Ernie was in pursuit of academic research for the COAA's Best Practices Committee just at the time Dr. Simaan AbouRizk and Dr. Aminah Robinson Fayek approached the COAA to partner with the Industrial Research Chair (IRC) in Construction Engineering Management at the University of Alberta. Ernie volunteered to liaise with the IRC and headed off with Dr. Robinson Fayek on a flight of an altogether different sort.

“Experts don’t underestimate the knowledge that comes from the people doing the work.”

Since that day, Ernie has participated in a number of projects between the COAA and the IRC that provided immediate benefits to the industrial construction industry – an industry performance benchmarking study, studies to reduce field rework and workforce absenteeism, and a study to improve supervisory training, plus the development of tools to support improved practices in these areas.

Ernie modestly describes himself as “just a guy who hangs out, takes away more than he brings, and feels privileged to be on the inside of academics, able to observe a different world.” Nonetheless, he often speaks publicly for the IRC, and he co-authored a chapter for the book *Clients Driving Innovation* with Drs. Aminah Robinson Fayek and Jeff Rankin, entitled “Client Driven Performance Improvement Strategies for the Construction Industry: Development and Implementation Challenges.”

A keen observer of two worlds – industry and academia – Ernie has noticed that the “good ones” dwelling in each share similar characteristics. They are open to people, make excellent listeners, embrace new ideas, and possess good humour. “Experts,” Ernie says, “don’t underestimate the knowledge that comes from people doing the work. They’ll tell you what they know, but ask as many questions in return.”

Ernie thinks Dr. Robinson Fayek’s current IRC in Strategic Construction Modeling and Delivery will produce a much needed shift toward accepting change and development in industry practices, rather than merely following the rule-of-thumb, which is the way industry tends to do things now. “Throughout the world at the executive level,” Ernie says, “often the complexity of mega-projects is not fully

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Ernie Tromposch, P.Eng., CCM
PMO Program Leader -
Construction Management, NOVA
Chemicals

Message from the Chair

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collaborative research has been driving R&D and innovation in Canada for the past 10 years. The IRC extends this powerful model down into the structure of its research program by assembling three major construction groups – owners, contractors, and labour – into a unified research consortium. Together we have the opportunity to create far-reaching, innovative approaches to decision-making that will transform the industry.

It is critical that we have support and involvement from a wide base of industry stakeholders, in order to carry out research that is representative of the construction industry’s needs and has a far greater potential for positively impacting the construction industry in Alberta and across Canada. I look forward to seeing many of our research efforts enhance the performance of Canadian construction and keep the industry competitive on a global scale. ■



18th Annual Canadian Construction Research Forum:

Advancements in Best Practices and Applied Research in Construction Engineering & Management

The advancement of construction research is a global and collaborative effort. As a key participant in today's construction engineering research, projects, and education, your work is significant in driving innovation and development within our industry.

We would be honoured to have you join us to share your ideas and learn more about current advancements within the industry by participating in workshops and attending discussions at the 18th Annual Canadian Construction Research Forum, which will be held May 10 & 11 on the University of Alberta campus.

This year's forum features the following keynote speakers:

- Dr. Sheryl Staub-French, Department of Civil Engineering, University of British Columbia
- Dr. Jochen Teizer, School of Environmental Engineering, Georgia Institute of Technology
- Dr. Nashwan Dawood, Director, Technology Future Institute, Creator, Centre for Construction

Presenters from the University of Alberta's Hole School of Construction Engineering include Dr. Simaan AbouRizk, Dr. Mohamed Al-Hussein, Dr. Aminah Robinson Fayek, Dr. Yasser Mohamed, and Dr. Ming Lu.

The Forum is in its 18th year of circulating ideas, practices, and solutions among researchers and students at the Hole School of Construction Engineering, national and international academics, and our partners and colleagues in the construction industry.

We invite you to join the discussion of the future of construction engineering and management research and education in Canada and beyond.

Preliminary Program

Thursday, May 10, 2012

7:30 a.m. Registration & Continental Breakfast

8:30 a.m. Welcome

8:45 a.m. **Advancing through Research**

- **Research Activity at the Hole School of Construction Engineering**
- **Why Collaborative Research Works** - Ian Johnston, PCL

9:45 a.m. Refreshment Break

10:15 a.m. **Meeting the Needs of Today's Construction Environment**
Session I - Parallel Workshops

- **Labour Productivity & Construction Competitiveness**
- **Process Improvement**

12:00 noon Networking Luncheon

1:30 p.m. **Meeting the Needs of Today's Construction Environment**
Session II - Parallel Workshops

- **Canada Best-Practices on Building Information Modeling (BIM)**
- **RS Means on the Cloud: Advancements in Cost & Productivity Estimating**

6:30 p.m. Awards Dinner
Keynote Address: TBD

Friday, May 11, 2012

8:00 a.m. **Construction Research: A Global Perspective**

- **Modularization: The Future of Construction**
- **Research and Application of Emerging Technologies Leading to Hazard Free Construction Sites**
- **Building Information Modeling (BIM): A Visual & Whole Life Cycle Approach**

9:30 a.m. Refreshment Break

10:00 a.m. **Emerging Technologies for Productivity and Safety Improvement**

- **Automated Real-Time Tracking and Visualization Technology for Construction Safety**
- **GPS and Proximity Detection Technology for Safe Site Operation**
- **Turning Total Station into TBM Navigation Robot in Tunnel Construction**
- **Wireless Sensor Networks based "Local Indoor GPS" for Resources Tracking in Industrial Construction**
- **A Framework for Enabling Construction Workspace Management: A Serious Game Engine Approach**
- **Digital Facility Asset Management Using Web3D Technology**

11:45 a.m. Closing Remarks

12:00 a.m. Luncheon
Keynote Speaker: Organizing BIM Projects: Issues and Lessons Learned - Dr. Sheryl Staub-French, University of British Columbia

For more information or to register, contact Brenda Penner at (780) 492-5120 or brenda.penner@ualberta.ca.



Ernie Tromposch: Best of Both Worlds

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appreciated.” These days, many still think changing the foundations of a multi-billion dollar project – by enlarging the scope, or by shortening timelines, midway through the project – is easy, just because it’s big.

“Not so,” Ernie says, “even little things can have a huge impact on the outcomes of a large project.” He thinks Dr. Robinson Fayek’s work identifying and analyzing the impact of different factors on project outcomes should prevent the kinds of construction disasters that have occurred in the past. He says, with the help of Dr. Robinson Fayek’s research, “in five years, the Canadian construction sector will be able to work a bit smarter, not just harder.” Meanwhile, flying high above the clouds, Ernie is, simply, enjoying the view. ■

Welcome to IRC KeyNotes

The IRC program’s success depends on rich communication among the Chair and all industry partners. IRC Keynotes, our quarterly newsletter, is one of several information sharing and exchange tools we are implementing.

Our newsletter, website (currently under development), workshops, and the Annual Canadian Construction Research Forum (see page 3) are all part of our ongoing efforts to build and maintain a strong dialogue among the academic and industry partners of our Chair. We welcome your ideas on how best to communicate with you.

We hope you enjoyed the first issue of IRC Keynotes. If you have any comments about this issue or content suggestions for future issues, please contact Jack Skrip at (780) 492-1228 or skrip@ualberta.ca.

COAA Best Practices Conference

May 15 & 16, 2012

Graduate students from the University of Alberta’s Hole School of Engineering have been invited to showcase their work at the 2012 COAA Best Practices Conference, which will be held May 15 and 16 at the Shaw Conference Centre in Edmonton, Alberta. The engineering students have been given the opportunity to participate in a poster session to be held on the evening of May 15.

Dr. Aminah Robinson Fayek’s students are hard at work preparing posters describing their research, including Farhad Shams (Foreman Skills Development Tool), Moataz Omar (Absenteeism Tracking Tool), Adel Awad (SuretyAssist and SuretyQualification), Abraham Tsehayae (Labour Productivity Analysis & Modeling), and Jing Peng (Effective Implementation of WorkFace Planning).

This year marks the twentieth anniversary of the COAA Best Practices Conference, which is attended by over 400 construction industry professionals from throughout the province.

IRC Board Meeting

May 10, 2012

The next IRC Board meeting will take place on May 10, 2012, in conjunction with the 18th Annual Construction Research Forum on the University of Alberta campus (see page 3). The meeting will be held from 1:00 p.m. to 3:00 p.m. at a location to be announced.



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MODELING AND DELIVERY**

INDUSTRIAL RESEARCH CHAIR

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