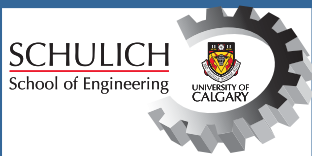




GEOMATICS
ENGINEERING



SCHULICH
School of Engineering

Message from the Head

As I wind down my last days as Department Head, I have been reflecting on the accomplishments of our faculty, staff and students and how their efforts and successes are continuing to enhance the quality and recognition of our program. The Department is at an exciting time and the future looks very bright. The recently initiated development of a five year plan will help to steer the Department in terms of developing priorities and assessing opportunities.

Our undergraduate students are continuing to have success in their studies and in industry. We recently graduated 42 students, 19 of whom had internship experience. 8 received their degrees with distinction, and Kimberly Johnson was the APEGGA Gold Medalist for the highest academic standing. Virtually all of our students have employment in Alberta and beyond. Congratulations to all!

Growth is certainly on the horizon for the Department. The recent

announcement by the Alberta Government to fund the Energy and Environment area will result in additional students and resources to our program—this will benefit the geomatics sector by providing additional graduates as well as new skill sets. We are working hard to continuously improve and enhance the quality of our programs to meet the needs of society. I look forward to continued involvement in this evolution in my new role!

Elizabeth Cannon
Professor and Head

Dean of Schulich School of Engineering

Dr. Elizabeth Cannon, a most accomplished scholar and teacher has been named Dean of the University of Calgary's Schulich School of Engineering. Dr. Cannon is a world leader in Global Positioning Systems research and the recipient of numerous teaching, research and leadership

awards. She will take over a five-year term effective July 1, 2006. "Dr. Cannon's appointment underscores the depth and international reputation of the Schulich School of Engineering," said Dr. Harvey Weingarten, President of the University of Calgary. "She is a recognized leader in her

field, she is valued and appreciated by a generation of students, and now Dr. Cannon has chosen to take on this responsibility at a turning point in the School's history. It is a real coup for the University of Calgary to be able to appoint her as Dean."

Faculty, staff and graduate students of Geomatics Engineering bid farewell to Dr. Cannon on June 15. We are all very excited for her and congratulate her on her latest achievement.



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Congratulations

- Congratulations to students who completed their graduate studies: Rita Cheng, MSc; Mwafag Ghanma, PhD; Chenglin Xie, MSc; Abboud Kaplo, MEng; Qiaoping Zhang, PhD.



Mwafag Ghanma successfully defended his PhD thesis

- Several faculty members received awards at the year end Engineering Faculty Council: Ayman Habib, Geomatics Engineering Research Award; Naser El-Sheimy, Geomatics Engineering Teaching Award; Mike Barry, Geomatics Engineering Service Award; Yang Gao, Schulich School of Engineering Graduate Education Award.

- Dr. Klaus-Peter Schwarz, (Professor Emeritus) was conferred the eminent title "Doctor Engineer Honoris Causa" by the University of Hannover, Germany, on the occasion of its 175th anniversary celebrations.

- Elizabeth Cannon was chosen as one of the leading scientists and entrepreneurs to have been named to the board of the new Alberta Information and Communications Technology Institute.

- Wouter van der Wal won the CGU Best Student Presentation Award and has also been awarded the Helmut Moritz Graduate Scholarship.

- Natalya Nicholson won a Communicator of Excellence Award at the GEOIDE Annual Scientific Conference. This is in recognition of her excellent communication skills in presenting a project overview.

- Shahin Charkandeh and Suren Shanmugam have received Best Poster Presentation awards at the iCORE Summit 2006.

- The 3rd Annual Schulich School of Engineering Graduate Student Research Conference (May 1 – 2, 2006) showcased over 140 student presentations in multi-disciplinary sessions. The conference was a huge success with over 300 people in attendance. We would like to congratulate our Department's Best Presentation Award winners: Mohannad M. Al-Durgham, Shahin Charkandeh, Mwafag Ghanma, Taher Hassan, Wouter van der Wal and Elena Rangelova. The success of this year's conference can be attributed to the hard work of the organizing committee members and support from SSE faculty and administration.



L to R: Dr. Michael Sideris, Elena Rangelove, and Wouter van der Wal enjoying the Graduate BBQ lunch

Student News

- Geomatics has a team playing in the Graduate Students Associations slow-pitch



Good luck to the team for the rest of the season!

league. The team, known as the Earth Movers, is comprised of individuals associated with the departments of Geomatics Engineering and Archaeology. People on the team this year from Geomatics include Mark Petovello, Wouter van der Wal, Jesma Secord, Michael Olynik, and Kirk Collins. The Earth Movers were last year's regular season winners with a record of 23-1 and are off to another good start this year tied for first place at 9-1.

- The Department had a strong presence at the annual meeting of the GEOIDE

Network of Centres of Excellence (NCE) held in Banff, May 31-June 2 and at the GEOIDE Summer School held in Calgary the following week. Four projects are led by ENGO faculty members and Professors Cannon, El-Sheimy, Gao, Lachapelle and Skone were in attendance (Professor Sideris, who is also a team leader, could not attend). Many ENGO research groups gave demonstrations of their research. The Summer School held in Calgary included lectures by departmental faculty members and presentations by graduate students.

Visitors

- Rene Forsberg and Henriette Skourup came from the Danish Space Centre (formerly KMS) March 30 thru April 8. They were working on a project funded by ESA.

- Special Presentations were given by Dr. Rifaat Abdalla, York University; Dr. Monica Wachowicz, Wageningen University and Research Centre, The

Netherlands; Dr. Bisheng Yang, University of Zurich; Dr. Michael Sutherland, University of New Brunswick; and Mr. Andrew Hunter, University of Calgary.



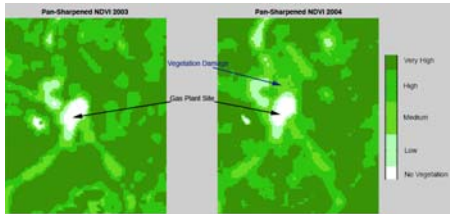
Dr. Raquet and his ENGO 699.45 class 'Advanced GNSS Receiver Technology'

Research Spotlight

Detecting Vegetation Stress Due to Acid Rain

Article by Dr. Isabelle Couloigner (Digital Imaging Systems)

Air pollution from industrial activities resulting in acid rain and deforestation is the main cause of damage to forests. Acid rain weakens the trees damaging their leaves, limiting the nutrients available to them, or poisoning them with toxic substances slowly released from the soil. Acid precipitation can cause direct damage to the foliage on plants especially when the precipitation is in the form of fog or cloud water. One of the research works of the “Digital Imaging-Remote Sensing” group is to use satellite imagery to assess acute and chronic vegetation damage due to acid deposition emanating from gas flaring, because trace gases released during the combustion of waste gas include sulphur dioxide, one of the primary components of acid rain. The use of vegetation indices,



Acute vegetation damage due to high level of acid deposition detected in 2004 compared to 2003 on pan-sharpened Landsat TM images (12.5 m spatial resolution).

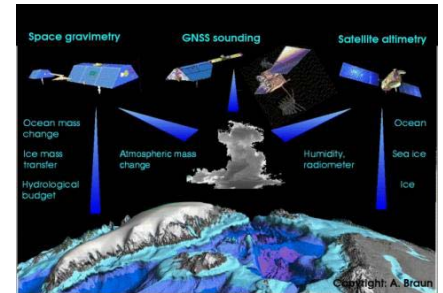
topographical data and temporal analysis enables us to assess and monitor the state of the forest around gas processing plants. Furthermore, appropriate data fusion/integration techniques help us to create finer details as well as to decide whether vegetation damage is due to acid rain or other environmental problems.

Space Gravimetry Contributions to Earth monitoring

Article by Dr. Michael Sideris (Gravity Field and Geodynamics)

Over the last decade, and even prior to the launch of the dedicated gravity satellite missions CHAMP, GRACE and GOCE, gravity field research using space borne data has emerged as a highly innovative discipline in Earth sciences. CHAMP has successfully proven the concept of space gravimetry for Earth monitoring. GRACE is expected to improve on the CHAMP results by two orders of magnitude, providing monthly snapshots of the Earth's gravity field down to the 150-km scale. And GOCE, to be launched in 2007, will map the Earth's gravity field down to the 70-km scale with cm-level accuracy. In addition, complimentary data from other satellites will become available and used for Earth monitoring, e.g., SMOS (ESA, soil moisture), IceSat/GLAS (NASA, ice altimetry), CryoSat-2 (ESA, ice altimetry) and SRTM (NASA, InSAR topographic mapping).

The satellite gravity missions are novel remote sensing tools for Earth monitoring. Therefore, the primary objective of this project – which is funded by the GEOIDE Network of Centres of Excellence – is to fully



exploit the great potential of these missions, and to apply satellite gravimetry to Earth science disciplines like geomatics, hydrology, glaciology, geodynamics and oceanography. A multidisciplinary team of eleven investigators from four Canadian universities (Calgary, Toronto, York, Victoria) and three government agencies (Geodetic Survey Division, NRCan, Geological Survey of Canada, and National Water Research Institute), lead by Dr. Michael G. Sideris and including Geomatics Engineering professors Dr. Alex Braun (deputy leader) and Dr. Cathy Valeo, was assembled to tackle the diverse

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Alumni Voice

When I packed up a U-Haul and headed east towards Chicago to start a job with Motorola, I thought that I would be one engineer among thousands in a vast corporation and that it would be difficult to stand out or make a difference. I figured it would be great for my resume and that I would be out of there in five years tops. That was 11 years ago.

During that time I have worked in GPS, navigation, and location-based services (LBS) as an Applications Engineer, Engineering Manager, Marketing Manager, and Product Manager. In these roles I have worked with customers such as GM, Ford, Nissan, Verizon, Cingular, Sprint-Nextel, H-P, Lucent, IBM, Avis, OnStar, and Rand McNally. My current business unit has pioneered low-cost wireless navigation with products and location services

including Smartnav, Avis Assist, OnStar Turn-by-Turn Navigation, and Rand McNally Mobile Navigator. I have had the opportunity to speak at industry events. I have authored papers and contributed to a textbook and I have received several patents. Throughout these experiences I have constantly been challenged and I have continued to learn.

My education in Geomatics Engineering gave me skills and expertise that are quite unique at Motorola (try finding someone who even knows what Geomatics is!), empowering me to distinguish myself and to teach those around me. I have been a part of small business units that can be considered startup firms, with Motorola as the venture capital source. As such, the company doesn't feel as big as it is, yet you have the power and resources of a global

firm with a strong brand. Without a doubt, the presentation and writing skills honed through lecturing and writing at school (especially grad school) gave me the ability and confidence to communicate effectively both inside and outside of Motorola.

I have recently completed an MBA at Arizona State University (where I even had to dust off some statistics and matrix algebra!) and I plan to pursue business roles..... in the Geomatics industry of course.



J. Blake Bullock BSc '93, MSc '95



DEPARTMENT OF GEOMATICS ENGINEERING

Schulich School of Engineering
University of Calgary
2500 University Dr. NW
Calgary, AB Canada T2N 1N4

Phone: 403 220 5834
Fax: 403 284 1980

Email: geomatics@geomatics.ucalgary.ca

A Passion for Excellence

We're on the web:
geomatics.ucalgary.ca

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scientific problems. Other collaborations include researchers from the university of New Brunswick, the Ohio State University, the University of Colorado at Boulder, the University of Thessaloniki, Greece, the University of Stuttgart, Germany, the Canadian Space Agency and the European Space Agency.

The deliverables of this project are several novel products, namely: (i) a time-variable height reference surface (vertical datum) beyond secular changes and without systematic distortions; (ii) space-gravimetric water budget estimates (soil moisture, snow load) for river basins to be integrated into a comprehensive hydrological model; (iii) an accurate post-glacial rebound model, independent of geophysical assumptions and of sparse terrestrial data; and (iv) ocean circulation estimates from combined satellite altimetry and space gravimetry, independent of oceanographic data and models. Underlying all these products are highly accurate, homogeneous and time-variable gravity and geoid models, derived from the space missions, which constitute a quantum leap improvement over decades of previous gravity field research, and which will allow, for the first time in Canada without loss of accuracy, the replacement of spirit leveling by a combination of GNSS and geoid heights.

Department Activities



- Geomatics Strategy meeting was held on May 18 at the Valley Ridge Golf Course.
- Dr. Bo Huang will be joining The Chinese University of Hong Kong as an

Associate Professor of GIS whereby he will be completing his tenure in our Department, June 2006. This institution is substantially increasing their activities in the GIS area, and it will be a significant opportunity for Bo.

- Dr. Wirasinghe's term as Dean will end on June 30, 2006.
- Dr. Susan Skone will serve as Acting Head of the Department from July 1-December 31, 2006. A search for a permanent Head will commence in September with an expectation of a January 1, 2007 start.
- Drs. Mike Collins and Cathy Valeo will take a one year sabbatical leave effective July 1, 2006.

- The UofC annual campus fair was held on June 17th. This very important event allows us to explain to the public (particularly future students and their parents) what Geomatics Engineering is.



Sae, daughter of Santosh and Seema Phalke, was born on 22nd March 2006 and weighted 6.7 lbs..

Coming Events

- Special Graduate Courses: Dr. Heribert Kahmen—High Precision Positioning & Navigation for Industrial Production Processes, July 04-14.
- Schulich Engineering Stampede Breakfast—July 06 from 8am—10am.
- ENGO 501: Field Survey Camp, August 21 - August 31, 2006.

Sites to Visit:

- <http://www.cgu-ugc.ca/>
- <http://www.geoide.ulaval.ca/conference/>
- <http://gi.leica-geosystems.com>
- <http://www.spacecenter.dk/>
- <http://www.LUTW.org>
- <http://www.iCORE Summit 2006>