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McGill

Centre for

Intelligent Machines

Newsletter

Welcome to CIM

There will be a CIM Student Welcoming/ Orientation Meeting on Friday September 16 at 9:30 am for all new students. This is an opportunity to meet Dr. M.D.Levine, Director of the Centre, and members of the Technical and Administrative Staff. There will be a presentation on the various aspects of the Computing System of CIM and an opportunity to ask questions and meet the other students over coffee and donuts. Please mark the date on your agenda and make a point to drop in to Room 437. Watch the motd for further information.

Our Library - Chapter 2

Many thanks to everyone who took the time to answer our Library Survey in the last Newsletter. Your replies and comments have been compiled and the following is a short summary of the results. However, we don't have any easy solutions. If we follow any of the following recommendations we will need committed volunteers willing to take the time to regularly organize and catalog the journals. If you wish to help or after reading the following have any additional suggestions, please let me, Thomas, Dan or Ahmed know. Thanks.

1) Regarding the issue of conference proceedings it is clear that people would like to have them around; however, it is also clear that we have no money to purchase them. Perhaps the solution would be to catalog which people own various proceedings and make the list public. Anyone interested in a particular conference proceeding would then approach the person directly.

2) Regarding the issue of organization it is unclear how this can be resolved without placing too onerous a load on whoever volunteers for this task. For example, there is the question of how it would be maintained. Suppose the whole library is arranged by journal and chronologically. Is it realistic to expect users to replace a journal in its correct chronological location, given that we currently have a problem with people replacing journals at all? If not, then who is going to constantly monitor the state of the journals?

3) Finally, it would probably be of great use to people if there would be a posting of the index of the latest issue of the various journals as they arrive. For example, the index for each journal could be typed and posted to a newsgroup, i.e. cim.library. This would serve to increase awareness of what articles and journals are available. However, I would have to add that it would take a lot of effort to do this for journals such as Science and Nature which are weekly journals and each issue has a large number of articles.

Results compiled by Thomas Jelonek

Election Day - Monday September 12

All classes, laboratories and examinations in all Faculties and the Centre for Continuing Education are cancelled on Sept. 12. All employees are given permission to leave the University at 4:00 p.m. Don't forget to vote!!

Use of CIM Facilities

Please remember: if anyone outside the University would like to use the CIM facilities, they must be charged a fee which is credited to CIM. The charge will be determined by the amount of time spent at CIM and the type of work being done. Also, if 'insiders' use the facilities for private consulting or contract work, CIM must be compensated.

Robot (and People) Superstars

Scientific research is sometimes perceived by the general population as tedious, esoteric, uninteresting. The recent IRIS conference in Toronto afforded an opportunity for the CIM research community to dispel this popular misconception. In addition to impressing the research community, posters and demos prepared by CIM staff and students were also viewed by various media who reported the work more generally.

Recently, the CTV National News started a weekly feature called *The Leading Edge* in which they report on impressive gadgetry from around the country. In the Wednesday, August 10th issue of the feature some of the CIM demos were presented. **Roger**, the computerized air traffic controller was introduced by our own **Charles Snow** of the Speech Lab. **Carl** and the **ARL Monopod**, two legged robots from the Ambulatory Robotics Lab, were also presented in the piece along with some thoughtful words by **Joey Mennitto**. The CTV story was also shown on YTV News.

While these CIM members are not yet household names, it is a great benefit to CIM and these individuals to have their work and their names reported around the country. While at the IRIS conference I spoke with Dave Hughes, the CTV Producer responsible for the coverage. He urged me to send him any "interesting" videos I might have of our research. Since *The Leading Edge* is a weekly feature, it represents a great opportunity for all of us at CIM to showcase our work. Should you be interested, please send your videos to:

Dave Hughes, Producer,
CTV News, 9 Channel Nine Court
Scarborough, ON M1S 4B5

There is a copy of the Aug. 10th presentation available in Room 406 if you wish to see it.

Submitted by Pedro Gregorio

NEWS AND EVENTS

Hats off to:

☞After a marathon month of twelve hour days, **Pedro Gregorio** has completed his master's thesis. entitled "Design, Control and Energy Minimization Strategies for an Electrically Actuated Legged Robot". Pedro will stay on at the Centre in the Ambulatory Robotics Lab for a while to work on experimental hardware. He'll also keep busy looking for a challenging mechanical engineering design job. To those also writing theses, take heart, there is a light at the end of the tunnel. Congratulations, Pedro!

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Good-bye to

☞**David Lamb** has also submitted his thesis and has just accepted a software engineering position at Hymarc in Ottawa. His parting remarks were "Thanks for making CIM a great place to work. I'll probably be at the Centre some time this fall, I may see you then." See you soon, David, and good luck!

☞**Khaled Khader** has spent the last two years here under the supervision of Prof. Angeles. He has completed the final part of his Ph.D. "Smart Belt Conveyor for the Reorientation of Workpieces" in cooperation with El-Menoufia University, Egypt. He will be returning to his position as an Assistant Professor in the Mechanical Engineering Department. Wishing you all the success in your future endeavours Khaled, from all of us.

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Welcome to:

☞**Svetlana Ostrovskaya** is from the former Soviet Union, particularly - from Kazakhstan -

where she was a University professor teaching Classical Mechanics and Theory of Machines and Mechanisms. She did her Ph.D. many years ago in the field of Non-Holonomic Mechanics. Now she is happy to work here towards another PhD. in the field of Robotics Mechanics under Prof. J.Angeles.

☞**Dr. Andrés Kecskeméthy,** Assistant Professor at the Gerhard Mercator University of Duisburg, is visiting CIM for one year. Andrés will work in the Robotic Mechanical Systems Group in the area of object-oriented modelling of complex robotic mechanical systems. His affiliation in Duisburg with the newly created Institute for Mechatronics and its strong interaction with industry will surely add a new perspective to the RMS Group, and CIM at large. Andrés has an extensive experience in modelling and simulation of multibody systems, in connection with the German automotive industry. Here, he will focus on the theoretical aspects of mechanical system dynamics and its relation with differential geometry. Welcome on board, Andrés!

☞Having completed his thesis entitled "Decentralized Impedance Control", **Michel Doyon** now joins the Robotics Group as a Research Engineer under Vincent Hayward.

... and Robots

Sometime in September, the computer vision group will receive a new robot, a CRS Plus Gantry Robot System (G365) (CRS is a Canadian company based in Toronto). The three main axis of this 6 DOF robot are linear stages (X, Y and Z) which removes completely the singularities from its workspace (1.2m X 1.2m x 1m) and explains its very good precision. This feature will allow the newcomer to replace the old and tired Puma 560 (mounted upside down in room 418) currently used to move the sensors in the Autonomous Exploration Platform. The Puma will continue to work part time only to do some grasping (and to keep us busy fixing it...).

Articles & ideas are welcome. Please send them by e-mail to the editor. Deadline for publication is the 7th of every month.

Editor: Janet Burghardt (e-mail: jmb@cim.mcgill.ca)

Associate Editors: Paul Mackenzie
Kathleen VanderNoot

EEGSS Beach Party!!!!

EEGSS, your Electrical Engineering Graduate Students Society is holding its second annual beach party to top off its Orientation Week events. The party will take place on Sun. Sept. 18th, at a lovely cottage, right near the beach in Ste. Agathe, where we can go canoeing and hiking, play ultimate frisbee, BBQ ...

Tickets are only $10 for EEGSS members (any Elec. Eng. grad student) and $15 for non-EEGSS - Including transportation! Everyone is welcome so bring a friend!

For more information contact your nearest EEGSS rep: Gal (sela@cim) or Marc (bolduc@cim).

Imagine this...

Farzam Ranjbaran and **Hamid Daniali** attended the ISRAM / 94 conference in August at which time they presented their papers entitled "The Kinematics of A Parallel Wrist wWth Actuation Redundancy" Authors: M. Becker, V. Hayward, F. Ranjbaran and J. Angeles; "The Direct Kinematics of General Parallel Manipulators with Minimum-Sensor Data" Authors: K. E. Zanganeh, and J. Angeles and "The Design of Isotropic Planar Parallel Manipulators" Authors: H.R. M. Daniali and P.J. Zsombor-Murray. They didn't have anything interesting to say about the conference itself but they had lots to say about their surroundings .... poor fellows were in Mauai, Hawaii for a whole week !!

'Tis almost the season ...

Yes, the Fall Semester has just only begun, the students have returned, classes have resumed and the aura of that summer vacation is still upon us.... but ...it is already time to start planning the '94 edition of the CIM Christmas Party. The reason for the early start this year is to plan some sort of 'Talent Show'. You probably don't know that your office mate has a hidden acting talent and neither does he suspect that you are a gifted musician! So this is a challenge to all Cimites to get together and show our stuff !! Start putting your ideas together, make some suggestions, be inventive, lets get organized and put on a special production for the December Party.

I would lilke to plan a first meeting of all interested volunteers in the last week of September. Please email <kathleen> if you are willing to help and we will set up a meeting date a.s.ap.

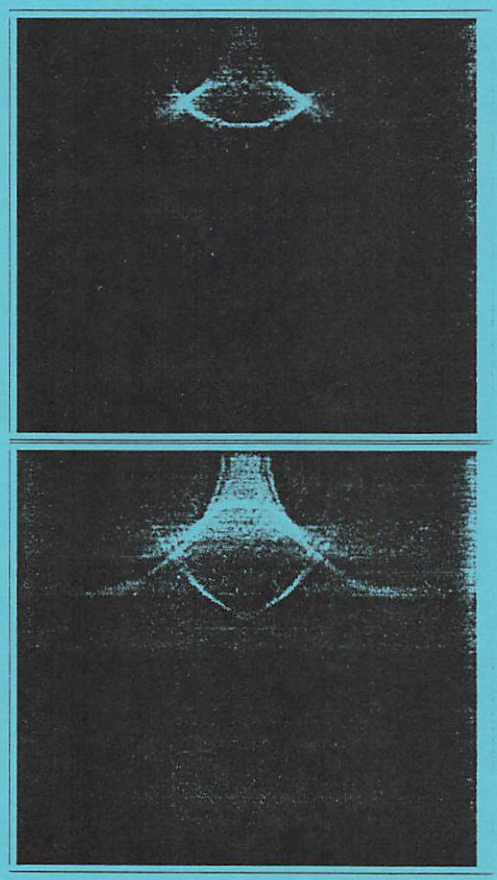
Ground Probing Radio Detection and Ranging

Ground Probing Radio Detection and Ranging, also known as Ground Penetrating Radar (GPR), is a non-destructive technique similar in principal to seismic applications. An electromagnetic energy pulse propagates into the ground and the partial reflections are sampled and recorded. Radar technology hardware is diverse, however the concepts it operates on is the same.

Time plays a decisive role in the electromagnetic propagation phenomena. In the application of Ground Penetrating Radar (GPR),an initial problem in the inversion of the electromagnetic reflected waves relates to the geometrical dimensions estimation and consists of major assumptions about the *wavefield* -- wave propagation velocities -- properties. Furthermore, these assumptions introduce *spatial distortion* to the estimated discontinuities.

To attain an image realization, the projection of the empirically (sensor based obtained *hyper-space* along the depth dimension is required. The two-dimensional picture construction are usually based on the assumption that the depth and time dimensions are orthogonal and confine the propagation velocity to a constant value. To remedy the mentioned problem discerned as non-linear, we investigate the possibility of correcting the projection of the **time/depth** space and hence, result in the recovery of the distorted shapes.

Submitted by Ameen Maluf



Cross section of a cylinder, prior to correction and after.

CIM TOP TEN

Top Ten things to do in Paris this summer:

⑩ Guess the nationality of each tourist in Paris.

⑨ Speak to Parisians with a thick Québecois accent and watch them shake their heads in bewilderment.

⑧ Start loud arguments with 10th century French sculptures in the Louvre.

⑦ Try to drive in the circle around l' Arche de Triomphe without (a) hitting other cars (b) having your car searched for Algerian tourists.

⑥ Design advanced image processing techniques to make La Seine look blue and unpolluted.

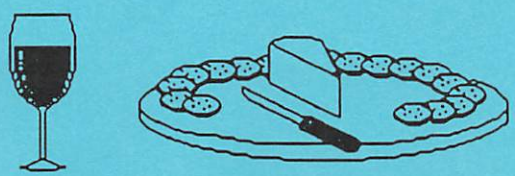
⑤ Find a city block without at least 1 church.

④ Play hide-and-seek in the Paris Metro (this may take a long time...)

③ Break the wrists of people who try to pick your pocket in the Metro.

② Baguette jousting on the Champs Elysées.

① Hop on the TGV and head for the Riviera.



Top Ten excuses for an extended holiday in Nice, France:

⑩ ..."to learn about SGI's graphical interfaces, I was studying FORMS on the beach"

⑨ ..."I mistook the Mediterranean for the St-Lawrence River and thought I was already home"

⑧ ..."A young woman lost her bikini top and I was helping her look for it"

⑦ ..."Couldn't leave until I saw at least one cloud in the sky"

⑥ ..."I still had some clean laundry left"

⑤ ..."I first had to meet each and every tourist in Nice"

④ ..."Just a few more museums to go"

③ ..."I hadn't sunburned ALL my skin yet"

② ..."I needed a few days to recover from that bouillabaise party"

① ..."2 words: 'I quit!' "

Submitted by Paul Mackenzie from the home office in Dijon, Burgundy