



McGill

C e n t r e f o r

Intelligent Machines

CIM SAFETY COMMITTEE

The members of the newly-formed CIM Safety Committee are: Professor Martin Buehler, Professor Hannah Michalska, and Diego Camelo Duque. The aim of this committee is to:

'Point out safety hazards to research supervisors to help prevent accidents involving operation of their equipment in the CIM labs, rooms 411, 416, and 418; and to make recommendations on the elimination/removal of those hazards'.

The committee's operating strategy is as follows:

- Contact the McGill Safety Office and other robotics labs to collect both general safety information and safety precautions for specific equipment.
- Regularly tour the labs to keep an eye out for possible hazards and to check for new equipment.
- Prepare a list of recommendations and guidelines for each lab and post this information in the lab.
- Compile a list of distributors of safety devices and supplies and act as resource people in recommending appropriate devices.

The committee members are volunteering their time and energy to help make CIM a safer place to work. We were told of one accident where a student was hit in the head by one of the robots (and thankfully, not injured) in room 418, and also of a few possible hazards which we hope to eliminate with the safety committee's recommendations. Ultimately we want to ensure that anyone visiting or working in the labs can do so safely, and from the interest and determination these three people are showing, it looks like 'we're in good hands'. Please feel free to contact them with any questions, concerns, or suggestions you may have.

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Newsletter

IRIS UPDATE

On March 28th, 1994, it was announced that IRIS was selected as one of the ten Networks of Centres of Excellence to receive Phase 2 funding. Iris has been awarded \$20,527,500 over four years. Although this is less than the \$29,100,000 requested, given the severe competition for a reduced pool of funds, we can be very pleased. Overall 10 of the 14 applicants were recommended for renewal.

In total, \$140 million was awarded to the ten successful Networks, they had requested a total of \$213 million. \$48 million has been set aside for a competition for new networks.

The funding is to be awarded on an annually decreasing basis in order to encourage efforts within each network to increase contributions from outside sources. The IRIS profile is as follows:

1994 - 95	\$ 6,247,500.
1995 - 96	\$ 5,652,500.
1996 - 97	\$ 4,462,500.
1997 - 98	\$ 4,165,000.

The research committee will meet April 7th and its recommendations will be taken to the Board on April 13th after which time the continuing projects will be defined. Details of the profiling of the funding may not be complete until some time in June.



REDIESTRO ACTIVITIES

In case anybody has noticed, the REDIESTRO robot did not get stolen from room 418 or walk away from its moorings. Now that it is back in its place, what on earth is the use of that big mirror lying at its base? No, the mirror is not there to please

narcissists! The recent commotion and activities around REDUESTRO are related to a few projects for two undergraduate Mech. Eng. courses called Design II and Mech. Lab. II.

As the first part of the Design II project, the mirror and its adjustable frame have been designed and put together to serve as a very flat test-bed. We will use this arrangement to conduct accuracy tests in order to characterize the effects of the kinematic conditioning of the manipulator on its tip motion. Before conducting the accuracy tests a complete kinematic calibration of the manipulator is needed. This is the motivation for the second part of the Design II project. The students have designed and assembled a device that will connect the end-effector of the robot to its base through a spherical joint. This mechanism will be used to continuously measure the position of a reference point of the end-effector.

Mech. Lab. II projects are concerned with the characterization of the joint flexibility induced by the use of harmonic drives of the manipulator. Here we are trying to relate the input and output angular displacements of an actuator to the transmitted torque and thus arrive at some reasonable estimates for the angular stiffness and damping characteristics of the actuator.

Submitted by Farzam Ranjbaran

WORKPIECE REORIENTATION WITH A SMART BELT CONVEYOR

Flexible manufacturing systems with belt conveyors that transport workpieces in batches to be picked up by a robot motivated this work. In such systems, workpieces are discharged onto a belt conveyor with arbitrary orientations and then transported to another station where a robot picks them up. In order to enhance the reliability of the robot and minimize costs of operation, the workpieces should be presented to the robot with the same orientation, which is the task of the conveyors studied here. These conveyors are termed shaking conveyors because their transport speed is not uniform, but oscillating, with a periodic

velocity profile. Here, the load rides on the belt during an interval of the cycle and either slides along or flies over the surface of the conveyor in the remaining interval.

K. Khader, J. Angeles, and S. El-Shakery (Monufia University, Egypt)

Submitted by Khaled Khader

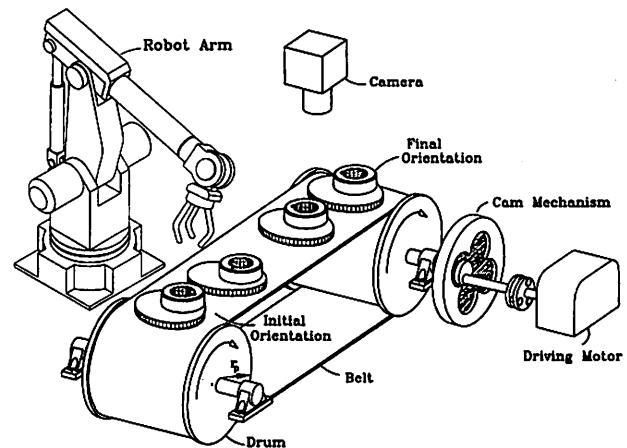


Figure 1: Suggested belt-conveyor array.

SEMINAR NOTICE

As you are probably aware, CIM is organizing a seminar entitled 'Have You Considered Starting Your Own Business? CIMBIZ'94', which will take place May 16 or 18. Several speakers have already been contacted and have made a commitment to present. They include: a professor from McGill's Centre for Entrepreneurial Studies (he's an engineering graduate!) who will present a business plan for different aspects of starting up, someone from the Federal Business Development Bank who will talk about acquiring financial support and government assisted programs, also someone from Innocentre will talk about marketing an idea or product and getting some backing (I think), and two former CIM students will talk about their experiences. There will probably be a nominal charge for this all-day seminar.

To finalize the details I need an idea of the number of people who are interested in attending. Please e-mail your interest to me (jmb@cim.mcgill.ca). I will finalize the details at a later date.

PGSS UPDATE – PGSS UPDATE – PGSS UPDATE

Need to relax a bit, here's the April - May movie schedule:

April 4,5,6: Bleu (France, 1993), Juliette Binoche and Benoit Regent.

April 11,12,13: Mrs. Doubtfire (USA, 1993), Robin Williams, Sally Fields, and Pierce Brosman.

April 18,19,20: The Three Musketeers (USA, 1993), Kiefer Sutherland, Charlie Sheen, and Tim Curry.

April 25,26,27: Manhattan Murder Mystery (USA 1993), Woody Allen and Diane Keaton.

May 2,3,4: M. Butterfly (USA, 1993), Jeremy Irons and John Lone.

May 9,10,11: Remains of the Day (UK 1993), Emma Thompson and Anthony Hopkins.

Submitted by Marc Bolduc

NEWS AND EVENTS

 **D**r. James Owen is now a researcher for Paprican in Pointe Claire. He will, however, stay at McGill as an adjunct professor also.

 **M**ichael Lee, who was filling in for Mike Parker, has left and accepted a position in Manhattan working for a Wall Street firm. We wish him good luck in any future endeavors he may undertake. And yes, after a year's leave of absence Mouse (Mike Parker) has returned to the Centre and has set up his office in room 443. Welcome back, Mike!

 **M**arch was the deadline for those hoping to graduate this spring. Roland El-Khoury (Evaluating a Speech Interface System for an ICU), Jean-François Panisset (A Double Precision Floating Point Convolution Processor), and Wassim Alami all handed in their theses looking very happy but very tired. Paul Dobrovolsky also submitted his major project, 'Kalman Filter: Estimation of Angular Velocity and Acceleration' at Concordia.

Congratulations to them and anyone else who was too exhausted to tell us the good news !

 **S**amir Shah also finished and is now at General Datacomm's new Multimedia R&D Centre. When asked what he thinks of his new job "Should be fun" was his main comment.

 **A**hmed Abu-Abed has recently joined General Electric Canada, after completing his MEng in mechanical engineering at McGill. At CIM, Ahmed worked under the supervision of Prof. E. Papadopoulos on the design of minimum reaction manipulators for high-speed or space operations. Part of his work is available as an internal report; he also co-authored two conference papers on the topic. Ahmed is now working as an industrial projects coordinator with the Electrical Distribution and Controls Division of GE, at their offices in Mississauga, Ontario. As his title suggests, he acts as a liaison engineer between GE manufacturing plants and clients' design staff in Canada.

 **Gossip from rm439:**

Pierre Breton and Karima got married March 12; Michael Langer and Corinna will get married in July; James Elder and Laurie will get married in August; David Lamb is getting worried...



CONFERENCE

Feedback Control, Nonlinear Systems, and Complexity

To celebrate George Zames's 60th birthday, a two-day conference is being organized to focus on three themes to which Professor Zames has made fundamental contributions. Here's an update:

Dates: Friday, May 6 and Saturday, May 7, 1994
Place: McGill University

Banquet: Friday evening \$37.59

NO REGISTRATION FEE for the conference.

To register for the conference please contact Bruce Francis (francis@control.utoronto.ca) or Allen Tannenbaum (tannenba@ee.umn.edu) or Jennifer Quinn (jennifer@cim.mcgill.ca) by April 22.

CIM TOP TEN

From the home laboratory in room 418:

Top Ten signs that you fit right in at CIM:

- ⑩ You are hired as a departmental research engineer before finishing your thesis
- ⑨ When going out for lunch with other CIM personnel, you don't find it strange that no one seems to know where to go until you all get there
- ⑧ Your daily wardrobe includes a cute yellow pen worn as a necklace
- ⑦ Instead of 9-5, your standard working day is 10-6. Or is that 10-7... 8... 9... 10...
- ⑥ You find it difficult to say "Hey chief, how you doin'" with a straight face
- ⑤ You regard Peter Whaite as a handy substitute for on-line man pages
- ④ You laugh at silly botanists who insist that money doesn't grow on trees
- ③ You show full and undying moral support for the managerial staff
- ② You think that conference rooms come equipped with seasonal indoor swimming pools

① Inwardly you say, "great, another @&)#!%\$ demo"; outwardly you say, "A demo? Of course I volunteer!"

Submitted by Paul Mackenzie

CIM COMPUTER COMMITTEE

The CIM computer committee met Wednesday, March 30. The minutes of that meeting are posted on Gopher for your information.

LOUSY LIMERICKS BY LARRY O'LEARY

There once was a student from CIM,
Who found that his laser was dim,
But when he looked o'er at Chief,
He said, "well, that's a relief
At least it's still brighter than him!".

