



McGill

C e n t r e f o r

Intelligent Machines

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Newsletter

New Name, New Look



he newsletter has a new format which incorporates the new name and logo of the Center for Intelligent Machines (CIM). We've redesigned the newsletter to give it a fresh new look. Faculty, students, staff - please contact Janet with your ideas. ▮

Visiting Professor Welcome

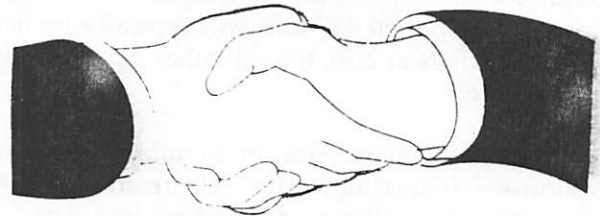
Professor **Manfred Husty** is a visiting professor who will be with the Mechanical Robotics group until September, 1994.

Dr. Husty is from the Institute of Mathematics & Applied Geometry at the Mining Institute of Leoben, Austria. He is essentially a geometrician who specializes in robot kinematics and kinematic and isotropic geometry. He is completing a text on the mathematical aspects of robotics for engineers, under contract from Springer-Verlag. This is the result of a research and teaching contract commissioned by the European Community which he directed.

Dr. Husty lives in room 425 and will be working with Paul Zsombor-Murray and Jorge Angeles but he has already expressed interest in the geometric aspects of shape recognition and interpretation as they apply to computer vision. Like many

Austrians he is multidisciplinary. He has a degree in Phys.Ed., specializes in track and field and alpine skiing. In addition he is an amateur violinist and chef. ▮

Submitted by Paul Zsombor-Murray



Student Volunteers Wanted

Now's the chance to add your personal touch to a task or an idea that interests you and to brush up on those underutilized skills!

If your talents lie in organization, please help us organize a Halloween or Christmas party, or a CIM sports team, a seminar, or the photo board. Perhaps you'd like to use your writing skills and submit regular articles to or co-edit the newsletter. If you like to practice your musical talents, why not volunteer to play at CIM parties. Or maybe you'd like to enhance the physical environment by helping to move furniture or clean the lab or lounge, then let us know. Whatever you can do to help make CIM a more pleasant learning environment would be appreciated by all. ▮

Come see Janet with your ideas.



Vision Seminars

The "McGill Vision Seminars" are sponsored by the Faculties of Science, Medicine, and Engineering. They are generally held on Wednesdays at 2:30 in McConnell 204. Coffee is served 10 minutes before the talk and beer is generally served following the talk, in McConnell 444.

The "CIM Vision Seminars" are sponsored by the Centre for Intelligent Machines, McGill. These take place in McConnell 437 and will typically be held on Wednesdays at 2:30, though other days or times are possible.

To schedule a vision talk, or to subscribe to our "vision-seminars@lightning" electronic mailing list, contact: David Jones djones@cim.mcgill.ca

All Vision Seminars on Campus are posted on the CIM GOPHER. Hopefully other volunteers could help keep the Robotics and Control Seminar postings on GOPHER up to date as well. ▀

Submitted by David Jones

Meet the Robots

The robotics lab is home to several robots. Some of these are industrial models, while others are experimental designs. Here's a quick tour. In brackets [] are names of the local experts on the various pieces of hardware and software.

A Puma 560 called "Frank" can be seen hanging from the ceiling above the optical bench in the vision group area of room 418 [Pierre Tremblay, Gilbert Soucy]. The 560 is a common six-axis industrial robot typically used for light duty tasks like painting or welding. It is programmed using RCCL

[John Lloyd], and presently runs on Obelix (an SGI workstation adjacent the robot). Frank's end effector holds 2 cameras: a 2 axis scanning laser rangefinder, and a CCD camera. The laser rangefinder is supported by a 68020 single-board computer running VxWorks, and a wide variety of software tools for image capture and robot control exist on both Sparc and SGI platforms [Pierre Tremblay, Gilbert Soucy, Duncan Baird]. The CCD camera is supported by a Datacube frame grabber, and is closely linked to the Maspar [Francois Gauthier]. This setup is used by the vision group to support experiments in 3-D modelling and exploration.

A Puma 260 called "Goldenchild" lives on the optical bench near Frank. Its rather curious name is no doubt a result of the fact that the 260 is kinematically similar to the 560 but much smaller, and gold-like in color. It is also controlled by RCCL on Obelix. It has a pneumatic gripper and is generally used by the vision group for vision-directed grasping work [Pierre Tremblay, Gilbert Soucy].

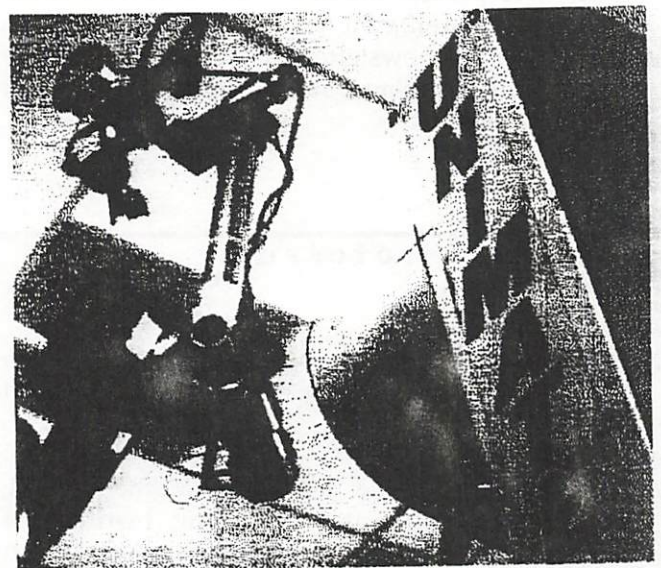


photo: Duncan Baird, André Lejeune

Another Puma 560 sits on the floor in approximately the centre of the lab. It is manipulated using a control package called Kali, which runs on a pair of TMS320C30 DSP processors, which themselves are supported by Hannibal, a Sparc IPC [Duncan Baird, Paul Dobrovolsky]. Typically it is used for experiments in calibration, estimation and control. It is mounted on a six axis force sensing platform which permits precise measurement of reactive forces [Robert Lucyshyn].

A small flexible-link robot emulator setup is located near Hannibal. It consists of various motion sensors and a harmonic drive that are used for torque control and acceleration feedback experiments [Paul Dobrovolny].

Diestro and Rediestro presently sit near the Kali-controlled Puma 560. These experimental robots are immediately recognizable by the fact that their joint axes are not parallel. This characteristic is intended to improve precision in observation and control of the structure. They are controlled by the DSP processors on Hannibal [Karim Shafik].

A prototype anthropomorphic arm is under construction. At this writing, the shoulder joint sits in room 416 awaiting the completion of an elbow and wrist. This robot is powered by hydraulic actuators, which deliver tremendous force and little noise. One of its most interesting features is that it is actuator redundant, meaning that it uses four actuators in parallel to control three degrees of freedom. It is supported by both a dedicated analog controller and by a pair of DSP processors linked to Arcas [Duncan Baird].


A significant part of room 416 is an exercise hall for a mobile robot called Emanon, or Rhys, or Robbie, or Pollux, depending on who you ask. The robot is a three-wheeled device standing about .5 m tall, and is vaguely suggestive of an immensely popular movie character of some years ago. It is equipped with a dozen sonar sensors which permit it to map and navigate the room. Its sensor complement is expected to expand to include a CCD camera on a pan/tilt head [Paul Mackenzie].

Here endeth the tour. I offer my humble apologies to any and all mobile mechanisms that I may have overlooked - as well as to their human slaves!●

Submitted by Duncan Baird

The CIM Top Ten List

From the home office in room 433

 Top Ten hints that something is wrong with your demo or lab tour:

10● Robot attempts to injure skeptical VIP by running over his/her feet

9● System runs out of Matlab licenses just as you are about to whip out some cool 3-D surface plots

8● Reporter and camera crew ask you if you can send the robot crashing into the wall again because they didn't get a good shot the first time

7● Visiting high-profile government minister tells you that it better work soon or he's outta there

6● Object recognition software interprets NSERC VIP's face as either a banana or a lemon

5● Speech interpretation software translates "Go to the red circle" as "smash into the nearest obstacle with all speed"

4● Hip tour participant asks, "yeah, but can it play Super Mario Brothers?"

3● After an in-depth explanation of your project, someone asks you where you bought your tie

2● Department manager swears loudly at you in the hallway after changing the tour schedule and not telling you

1● Tour group can't stop repeating, "Hey Chief, how you doin'?"

Submitted by Paul Mackenzie

The CIM Computer Committee

The committee was created about three years ago. Its purpose is to have a body representing all system users which will:

- Develop policies regarding computer resources usage.
- Define purchasing strategies for equipment acquired with CIM funds or funds provided by a majority of CIM members.
- Handle abuses of computer resources.

The user community is encouraged to bring their issues to the attention of the committee, by forwarding them to their representatives. Committee members are:

- | | |
|--------------------------|--------------------------|
| • Dr. Frank Ferrie | ferrie@cim.mcgill.ca |
| • Dr. David Jones | jones@cim.mcgill.ca |
| • Dr. Jorge Angeles | angeles@cim.mcgill.ca |
| • Dr. Martin Buehler | Buehler@cim.mcgill.ca |
| • Dr. Laeeque Daneshmend | Daneshmend@cim.mcgill.ca |
| • Dr. James Owen | Owen@cim.mcgill.ca |
| • Janet Burghardt | jmb@cim.mcgill.ca |
| • Carlos Perez | Perez@cim.mcgill.ca |

Last, the committee meets five times per year, twice per semester and once in the summer. Next meeting is to be held on September 27th, 1993.

Submitted by Carlos Perez

CIM Loto 6/49 Club

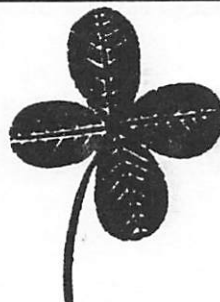
Dear all new and returning cimites, this is to inform you that at CIM we have a Loto 6/49 club which is in operation since 1985. The membership is open to all interested cimites. There is no FEE or any other charge.

The way the club operates is as follows: once you decide to join the club, you are requested to select any SIX numbers (out of 49 numbers) which you think is your LUCKY combination. The game is played TWICE a week (i.e. on Wednesdays and Saturdays). Each combination of six numbers costs ONE dollar. Hence, you need to contribute a total of TEN dollars for 5 weeks (i.e. for 10 draws).

Currently the club has 13 active members which includes staff and students. The best match the club ever had is FIVE out of SIX (5/6) numbers and it was worth approximately 1300 dollars. Normally you need to contribute about 6 to 7 dollars every five weeks. The minimum jackpot nowadays is around 2 million dollars every draw. This may be cimites jackpot one day.

For more informations, feel free to contact DAMIAN HAULE (club's administrator) at local 7159 in Room 463 or by e-mail (username "haule").

You are all welcome to join our LUCKY CLUB.!



David Morin Atelier Aedis