UVic knowlEDGE

Quiet, please!

A little UVic ingenuity goes a long way for hearing-impaired schoolchildren

by Valerie Shore

We all know how frustrating it can be trying to listen to someone when other people in the room are talking. You wish you could lower the volume on everyone else so you can follow what the speaker is saying.

Well, that's not going to happen. But what if you're a hearing-impaired child in a classroom? Sometimes you can't hear the teacher, and class discussions can be a confusing jumble of voices. Wouldn't it be great if there was a way to signal to the rest of the class that they need to quieten down?

That *is* going to happen—thanks to the creativity of the University of Victoria Assistive Technology Team (UVATT), a group of UVic researchers who design, build and test customized devices for the disabled.

The UVATT team includes faculty and staff from a wide range of disciplines, technicians, graduate students, co-op students, and hundreds of engineering undergraduates who enthusiastically design new devices as part of their course work.

"Students get to spend their time and inventiveness on projects that are making a real difference in people's lives," says UVic biologist Dr. Nigel Livingston, founder and director of UVATT. "You can't get that sort of experience out of a textbook."

Just ask Michal Osusky. This fall, the third-year engineering student spent a co-op work term with UVATT, building and testing a system to help hearing-impaired children in the classroom. "It's great," says Osusky. "You're not just sitting in a lab crunching out code or working on some lifeless thing. You actually see it impacting someone in a positive way."

All UVATT projects are suggested by individuals or organizations in the community who identify a specific need. In this case, the team is working with a Delta-based teacher for the hearing-impaired who selected two children in her school district who need assistance.

"We were asked to develop an indicator light system that would signal the other students to quieten down," says Livingston. "Many kids are self-conscious about their disability and don't want to draw attention to themselves by putting up their hands."

The prototype system features a microphone and sound meter, data acquisition hardware, a laptop computer specially programmed to analyse sound amplitude, and a small external circuit that triggers a traffic light-sized LED panel to turn yellow or red when sound levels exceed specified thresholds.

With feedback from UVATT team members, Osusky selected the components, custom-programmed the computer and built the external circuit board. He tested the system in a UVic lecture theatre and in classrooms at Lansdowne Middle School in Victoria and Hawthorne Elementary in Delta.

"At Hawthorne, we connected a remote switch to the computer that the hearing-impaired students could press every time they perceived the sound level getting too high for them to understand what the teacher was saying," says Osusky. "This allowed us to set thresholds for the indicator light."

Threshold levels can be easily adjusted by the student or the teacher. When class noise reaches 5 to 10 decibels below the threshold, the light turns yellow. When the threshold is reached or exceeded, the light turns red.

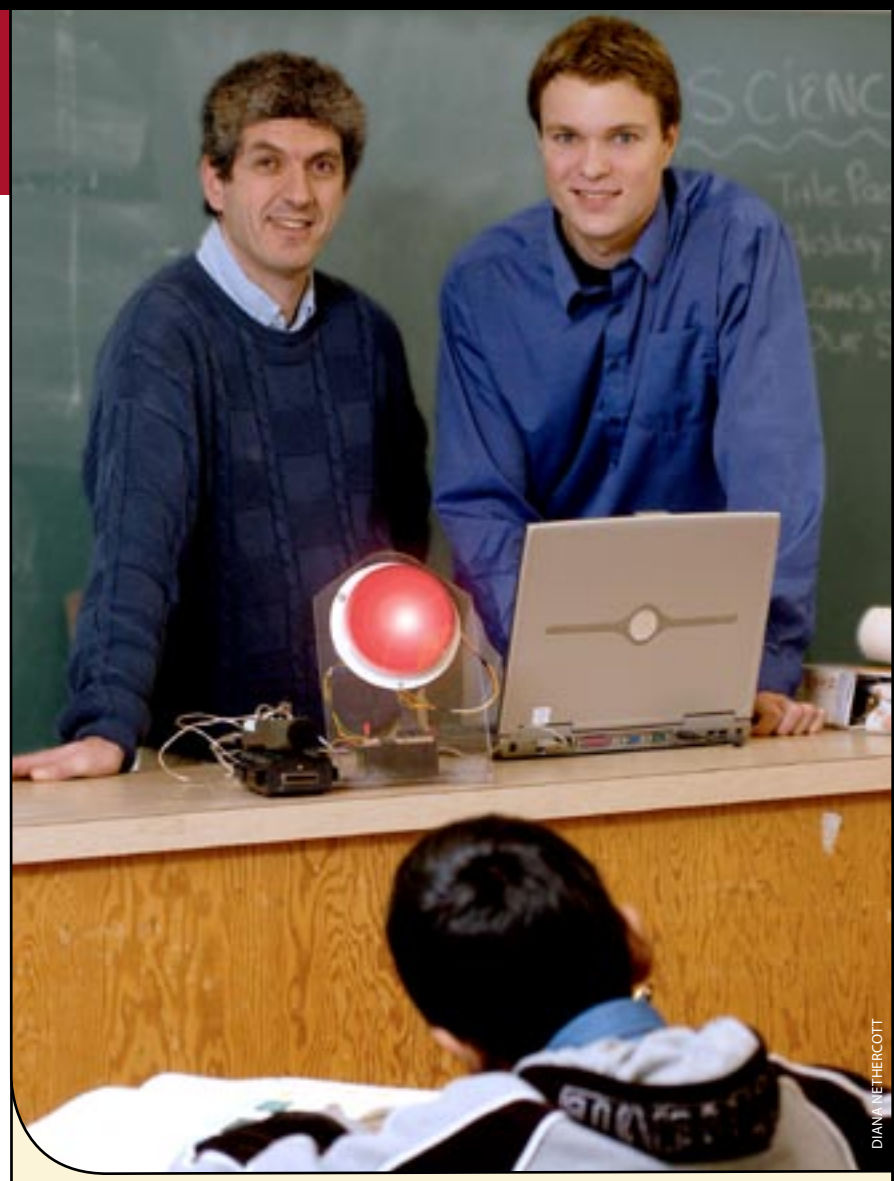
The loudest noise recorded by Osusky during classroom tests was 88 decibels during a class discussion. The typical threshold level set for the hearing-impaired students is 66 decibels for the yellow light and 72 decibels for the red light.

The light is placed at the front of the classroom so that the other students can respond accordingly when the light goes on. "When we tested this at Lansdowne, the response was very positive," says Osusky. " They noticed when it went yellow and made a conscious effort to quieten down."

This month, the system was shipped over to Hawthorne for long-term testing. Refinements are already underway to make it more portable and cost-effective.

"Using a microprocessor instead of a laptop we've got the parts costs down to about $250," says Livingston. "We want get that down to less than $100 so that a school can have several and not have to move them around."

Time will tell whether the system truly does the job, says Livingston. "We know it works technically, but the real bottom line is if the students come back to us and say they're understanding the teacher better and are learning more. That's the ultimate goal."



DIANA MATHERCOTT

Livingston, left, and Osusky with the new device for hearing-impaired children.

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Of the estimated 3.6 million Canadians living with a disability, 530,000 reside in British Columbia.

Since it was created in 1999, UVATT has worked on more than 35 new devices or technologies for the disabled, such as tricycles for sight-impaired children, and communication systems based on brain wave and eye movement for patients with ALS (Lou Gehrig's disease) or coping with the effects of a severe stroke.

Faculty, staff and many students involved with UVATT volunteer their time and expertise. But the team relies on donations for all the parts and materials that go into its devices and technologies, and for the ongoing support of graduate students and co-op students. To make a donation call (250) 472-4516.

To find out more about UVATT, to suggest a new device, or to volunteer visit www.uvic.ca/uvatt or call (250) 213-2442.