

## From the classroom to the stage

Students in two engineering programs at the University of New Brunswick in Fredericton ended their degree with a marriage of work and fun - by designing guitar pedals.

The final design project for computer and electrical engineering undergraduates this past year gave students a way to apply the concepts they learned at UNB to a project that could be used on stage by any guitarist.

The goal of the project was to design a guitar pedal (or series of pedals) with four specific effects - wah-wah, fuzz, reverb and tremolo - each with a different type of signal manipulation to provide a unique challenge to the students. Four additional effects were also integrated into each pedal system, chosen by each group from a list including delay echo effect, octave shifter, compressor, flanger and chorus.

To make things even more interesting, Bill Briggs, a senior engineering instructor at UNB, presented the challenge as a competition between the two programs' senior students, who were broken down into groups of four for the project.

"The electrical engineering students tackled the effects using analog circuits, and the computer engineering students did it with all real-time digital signal processing in a computer. The thing is set up that way as a bit of a competition to see who's able to produce better effects."

### A practical challenge

The choice of project was a special one for Briggs, who himself is a guitar player.

"I've had this in mind for a few years," he says. "I play guitar, and I used to have an electric guitar but I don't anymore."

The project let students in each program apply the specific knowledge they gained at UNB to make a practical final product.

"It was something that could be done by computer engineering students and electrical engineering students using two completely different techniques. It made for an interesting project," says Briggs.

When students got wind of what the project might be as they approached their final year, many were excited at the possibilities.

"When they heard the rumour that the project was going to happen, they actually came in to see me last July and said, 'please, can we do this?'"

## Pride in their work

Derek MacKay, who graduated from the electrical engineering program in May, says the project was truly enjoyable.

"The design perspective of the project was amazing, because the course requires so much time, but you're working on a topic that you've really got a passion about," he says. "It really made all the work seem not like work. You were there to learn, but you were also benefiting yourself."

He says he loved everything about the project - even the mundane, like troubleshooting when problems arose and the regular group meetings.

Derek and one of his teammates on the project, Justin Daigle, were so enthralled by the project that they're each in the process of building their own pedals.

"It really hit home when you sat back and looked at it, because this is something that you can see on stage.

"I'm intensely proud," says MacKay.

While not always specifically practical in use, Briggs says that each final project is meant to offer a challenge to students. For future projects, he's in talks with Fredericton's Stan Cassidy Centre for Rehabilitation - not only to make projects practical, but to bring benefits to the community as well.

The Stan Cassidy Centre provides rehabilitation services to persons with brain & spinal cord injuries and neurological disorders. The Centre also provides services in fabricating or modifying rehabilitation equipment related to mobility.

"We have meetings coming up with them to see if there are any projects they have that we can possibly roll into this course," says Briggs.



"If you can do something novel, useful and in this case useful to people in that clinical setting, that's a good thing."