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## 2010-04-08: Expanding possibilities of lunar exploration

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## Expanding possibilities of lunar exploration



Northeastern professor Marty Vona collaborated with NASA's Jet Propulsion Laboratory to design a software interface for a lunar robot. Photo by Lauren McFalls

**April 8, 2010**

Experimental roboticist **Marty Vona** won't be flying to the moon.

But his National Science Foundation-funded work on a robotic rover could help astronauts explore the big rock in the sky on a lunar mission within the next decade.

Vona, an assistant professor of computer and information science, collaborated with NASA's Jet Propulsion Laboratory in La Canada Flintridge, California to design a software interface for the research and development center's ATHLETE, or All Terrain Hex-Limbed Extra Terrestrial Explorer.

The six-legged vehicle can carry heavy payloads on its hexagonal surface; dig trenches and pick up objects using tools that can attach to its wheels; take stereoscopic video of its surroundings using cameras imbedded in the face of the frame; and navigate rough terrain. A half-sized prototype of the robot, which travels 10 kilometers per hour, is more than 6 feet tall and 9 feet in diameter.

But as originally developed, the robot had its limitations. That's where Vona came in. He used algorithms to virtually modify the robot by adding joints and links to a graphical representation of the vehicle. The joints function like elbows, while the links work like forearms.

Through Vona's computer interface, users can interconnect these "virtual articulations" with a model of the actual robot, enabling it to execute a variety of previously challenging coordinated motion tasks, as if the virtual components actually existed— saving NASA time and money.

"Robots are large and expensive," said Vona, whose scholarship focuses on robotics operations and control, "so you want to be sure you know how they're going to perform under certain conditions."

In a perfect world, "astronauts and the lunar robot will be roving around the moon as a team."

Before joining the Northeastern faculty, Vona spent two years at the Jet Propulsion Lab, where he created the science operations software for the Spirit and Opportunity Mars rovers. Vona earned the 2004 NASA Software of the Year Award for his work.

He's had a passion for building robots for as long as he can remember.

At around age 6, he wrote a letter outlining his wishes for humankind. "I wish that anyone could do anything if they tried," the note said. "For example, anyone could make a robot to do all the housework . . . life would be a lot easier."

For more information, please contact Jason Kornwitz at 617-373-5729 or at [j.kornwitz@neu.edu](mailto:j.kornwitz@neu.edu).

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