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Robots can't learn if they're tied down

Do androids dream of electric sheep? Yes, says Alan Peters, a Nashville-based robotics expert and entrepreneur.

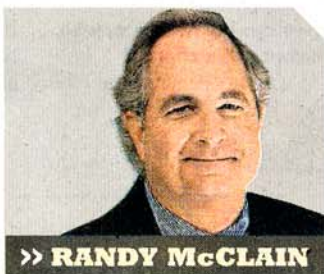
And they learn by doing — or more precisely, by moving and adapting to their environment. In real life, HAL-9000 of *2001: A Space Odyssey* movie fame couldn't have thought, learned and schemed as it did because it was a stationary machine.

Just like children learning to ride a bike, or swing a tennis racket, humanoid robots do their best in motion — not when bolted to the floor.

Peters, a Vanderbilt University professor with a knack for explaining complex science in a way we all can understand, hopes to hit it big with a startup company here called Universal Robotics. He and a small group of engineers are working in a mini-compound near Nashville International Airport to develop flexible, adaptable robots for use in industry.

After taking a leave of absence from

Vanderbilt University two years ago, Peters, two brothers and other investors backing the company have made strides in developing software that allows humanoid robots to learn on the job.



The company has created software and control systems for large robotic systems that can be used in warehouse operations, mining and the automotive world.

Peters has worked with NASA and with

Yaskawa America, maker of Motoman robots, to move industrial robots beyond simply repeating the same motion over and over and over.

Instead of simply moving from point A to point B to, let's say, move a car's door panel into place on the assembly line, Peters and company want a machine that can react. If a package slips off the shelf in the warehouse, a robot should be able to catch it.

Programming robots by hand to laboriously repeat the same motion on the assembly line is OK, if tedious, but

it's not the future, Peters says.

NASA lends five fingers

Peters' company got its start with the help of the technology transfer department at Vanderbilt, a few important patents, plus family members' money and several outside investors.

An early success came via a grant from NASA to work on a small piece of the Robonaut project, which will be deployed on the next space shuttle launch.

Robonaut is a dexterous humanoid robot built and designed at NASA Johnson Space Center in Houston. It's basically an early-stage machine with flexible fingers attached to a dual-armed humanoid robot that can help the humans work and explore in space.

But Peters' and Universal Robotics' initial paydays are more likely to come from a software package called Spatial Vision that it has developed for industrial use. The company has talked to major retailers (think Walmart) and others about licensing and support

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Professor is working on smarter robots

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agreements. Some deals have already been struck. Next year, should bring more revenue.

The software relies on precise algorithms, mathematical know-how and sensory motor data to extract and deliver to a robot's brain millions of patterns related to how objects (and the robot itself) relate in space.

If a package slips, in other words, here's how to catch it.

The commercial applications are numerous. Sure, Spatial Vision can help robots do more complex tasks in warehouses or on assembly lines. But it also means robots can be more successful handling tasks in dangerous places where humans would fear to tread — in airless space or deep beneath the earth's surface.

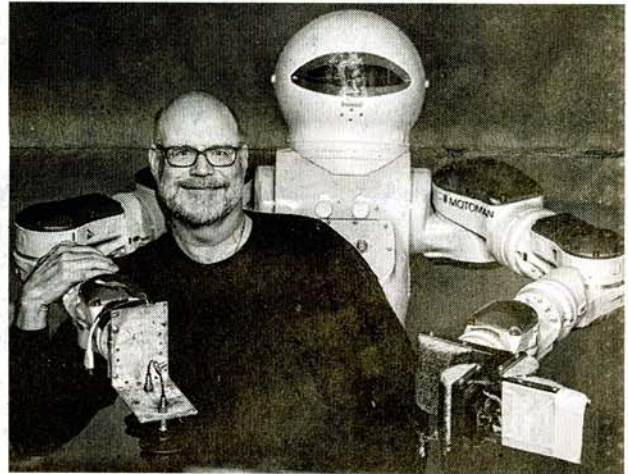
The real money for Universal Robotics, Peters says, won't be in traditional assembly line businesses

but in new markets not even dreamed of yet.

Postscript: Keep in mind, there are a lot more guys out there just like Peters. And many of them are descending on the Sheraton Nashville Downtown hotel for a humanoid robotics conference Dec. 6-9.

The group, known as the IEEE Robotics and Automation Society, will hold panel discussions on a lot of what Peters dreams about — principally, making more flexible robots. Participants will include experts from General Motors, Boston Dynamics and many others with a stake in the automation game.

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Alan Peters is a robotics expert who is working to expand the role of automatons. Peters says robots should do more than repeat the same task.

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