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HIGHLIGHTS



Survey respondents expect revenues to go up in 2010 and more will be looking for business outside North America.

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2010 outlook optimistic

The TD bank is forecasting anemic growth for the next three years with a very moderate improvement for the rest of the decade. This is life post-recession, now being referred to as the 'new normal.' But the results of **PLANT's** Canadian Manufacturing Outlook: 2010 shows 58% of senior executives are optimistic: they're expecting revenues to go up and 39% are planning to hire new employees. **SEE PAGE 12**

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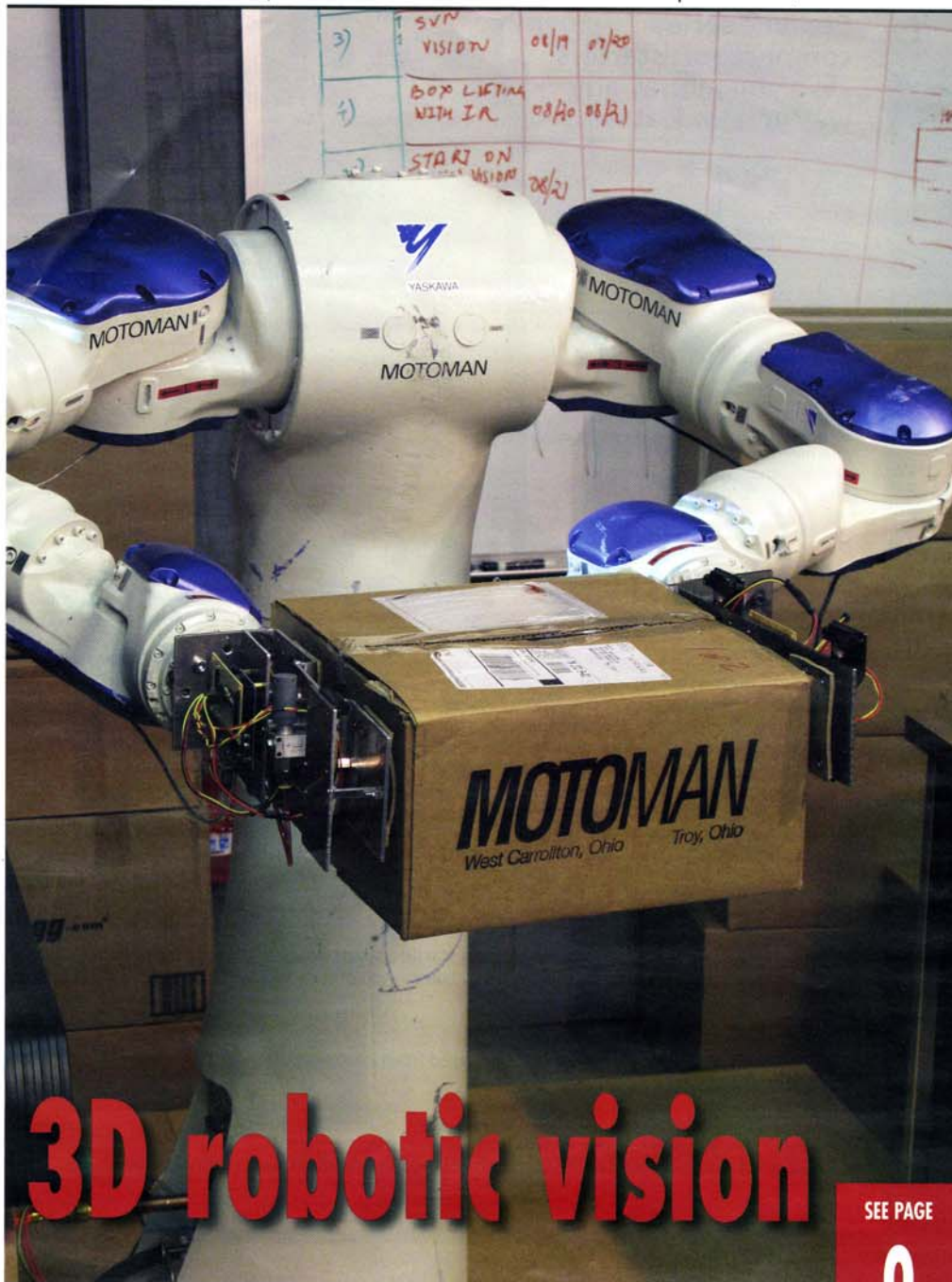
BULLET POINTS

- The Conference Board of Canada says of the six industries it tracked in a recent study, food and beverage manufacturing has been relatively recession-proof. Profits are up \$3.4 billion thanks to steady domestic food demand and rising exports. Hey, people have to eat.
- The federal government's spending on science and technology will reach \$10.7 billion in the 2009/2010 fiscal year: \$6.9 billion for R&D and \$3.7 billion for related scientific activities.
- Natural Resources Minister Lisa Raitt says there will be another national gabfest on advancing clean energy. There have already been roundtables on energy efficiency for communities, renewable resources and non-fossil fuel R&D. The next one will involve large industrial users of energy, such as the pulp and paper industry.

BOTTOM LINE

"We as a business community have become addicted to making a whack of money out of digging [bitumen] out of the ground and selling it to other people...who add value and sell it back to us for a profit."

Jim Stanford, economist, Canadian Auto Workers Union



3D robotic vision

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Motoman Inc. and Universal Robotics are combining breakthrough software with industrial robots to make materials handling applications more accurate, cost effective and "human." Robots equipped with Spatial Vision self-calibrating 3D vision software will be available to the materials handling market in early 2010.

PHOTO: MOTOMAN



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Teaching robots new tricks

BY CORINNE LYNDS, SENIOR EDITOR

Motoman Inc. and Universal Robotics are combining breakthrough software and industrial robots to make materials handling applications more accurate, cost effective and “human.”

The partnership, announced Oct. 1st, will integrate Nashville-based Universal's Spatial Vision self-calibrating 3D vision software into Motoman's industrial robots, which will then be launched in the materials handling market in early 2010.

About three years ago Motoman, a subsidiary of Japan's Yaskawa Electric Corp., introduced the first and only two-armed robot with 15 axes of motion. The SDA10D's (see SDA10D sidebar) actuator-based design forced the company to rethink its typical industrial applications because a dual-armed assembly robot needs advanced smarts to tackle new human-like tasks.

“So, 18 months ago we met with Uni-

versal Robotics and they got very excited about our arm. We realized it was the perfect match,” says Roger Christian, vice-president of marketing at Motoman.

“Often 3D vision systems have to be bench calibrated and if something happens in the field you've got to bring in an outside engineer to recalibrate it,” says Peters. “But this product allows for a routine to be run. If the cameras get bumped for some reason, you can just run the routine again and you're back in stereopsis (the process in visual perception leading to the sensation of depth from the two slightly different projections).”

Other 3D robotic vision systems, which are costly to implement and maintain, require extensive programming and laborious setup. These factors have limited wide adoption in many markets. Spatial Vision, on the other hand, is advancing 3D vision technology and making it viable for virtually any 3D robotic application.

“3D vision is typically going to cost you between \$35,000 and \$45,000, and that's sometimes more than the robot itself,” says Christian. “It may not mimic exactly the accuracy of a very expensive 3D system, but with some techniques we're trying to incorporate, it might just be good enough, at a very low price point, to give more access to our customer base.”

The Spatial Vision system automatically identifies any dynamic point using inexpensive web cams to deliver accurate, full-frame colour results at 960 by 720 pixels, four to five times per second.

According to David Peters, chief executive officer of Universal Robotics, Spatial Vision will cost between 10% and 20% less than competitive vision systems.

Vision 3D

“In addition to 3D bin picking, Spatial Vision-enabled robots handle automated applications including racking and de-racking of parts and picking loosely oriented parts on a conveyor belt.

Although the two companies are launching the product as a package deal, Universal Robotics' software is a stand-alone system that could be retrofitted onto an existing robot.

Robots are typically designed for a specific application, so the opportunity to retrofit may be limited because it's already doing what it's designed to do.

“If you wanted to take a robot you already have (robots last 15 to 20 years now) and move it somewhere else, certainly you could add this package to it and redeploy it,” says Christian.

Obviously Motoman would prefer to sell new hardware, but at least smaller companies with existing equipment or those purchasing a used robot can now afford to retrofit their equipment.

“If this technology pushes the price point down low enough where customers that wouldn't buy robots before now buy robots, that's a good thing,” says Christian.

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Motoman robot with 3D Spatial Vision for materials handling applications.

PHOTO: MOTOMAN

versal Robotics and they got very excited about our arm. We realized it was the perfect match,” says Roger Christian, vice-president of marketing at Motoman.

Universal Robotics' software was initially developed through research at Vanderbilt University and NASA in Nashville, where it has been the “brain” of their humanoid robot for years. (A humanoid robot is based on the human body to allow interaction with made-for-human tools or environments). The less than two-year-old company now creates technology that allows moving machines to actually learn from their experiences to perform tasks

MOTOMAN SDA10D FEATURES

- Actuator-based design provides human-like flexibility and fast acceleration.
- Dexterity and best-in-class wrist characteristics for assembly, part transfer, machine tending, packaging and other tasks once handled only by people.
- Highly flexible; 15 axes of motion (seven axes per arm, plus a single axis for base rotation).
- Internally routed cables and hoses (six air, 12 electric) reduce interference and maintenance and make programming easier.
- 10 kg (22.1 lb.) payload per arm; 720 mm (28.3 in.) horizontal reach per arm; 1,440 mm (56.7 in.) vertical reach per arm; ±0.1 mm (0.004 in.) repeatability.
- Both robot arms work together on one task to double the payload or handle heavy, unwieldy objects. Two manipulators perform simultaneous independent operations.
- Holds a part with one arm while performing operations on it with other arm.
- Transfer a part from one arm to the other.
- Advanced DX100 controller.

WHAT IS NEOCORTEX?

Neocortex is a machine intelligence operating system designed to be the brain of mobile machines, such as industrial robots. This software learns from physical interaction with the world—a process Universal calls natural intelligence. It enables machines to move freely in dynamic environments making decisions in real-time. Neocortex differs from artificial intelligence (AI) in one important way: this machine develops its own understanding from sensing and acting in the physical world, rather than being programmed. This allows machines driven by natural intelligence to perform tasks they couldn't do with AI.