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Backgrounder

Robots: Artificial Agents Get Real

Intel's Embedded Technology Brings Robots to Life

July 13, 2011 – No longer the realm of science fiction, robots are playing an increasing role in our everyday lives. Today, robots based on embedded Intel technology can be found in environments from factories to classrooms, and other places where you might not initially expect such as amusement parks.

Robots powered by Intel® Atom™ and Intel® Core™ processors provide the intelligence necessary to complete complex tasks that are impacting and improving our world. Intel processor-based robots built on the MobileRobots Motivity* platform can operate independently, with features that allow them to find their way around and roam in almost any environment. For example, robots can tackle dangerous situations such as clean-up of the 2010 oil spill in the Gulf of Mexico, and diagnosis of the environment in the Fukushima nuclear power plant following the 2011 tsunami and earthquake disaster.

Examples of Intel technology-based deployments include:

- **Qbo* by TheCorpora***
  TheCorpora supplies Qbo, an Intel Atom processor-based service robot with the capability to be fully programmed. Qbo is mobile and features a stereoscopic face, object and gesture recognition, as well as speech synthesis and voice recognition. The device can recognize and react to events, conceivably making the robot a fit for programming home-security applications that could help deter intruders.

- **Robocoaster* by KUKA Robotics***
  Intel Core processors provide intelligent performance for the KUKA Robocoaster, the robotic ride that thrills theme park visitors with 1.4 million possible motion sequences on six rotational axes. The Robocoaster fuels family entertainment centers and theme parks throughout the world including LEGOLAND* and Orlando's newest attraction at Universal Studios*. The Robocoaster delivers a heightened experience with capabilities such as whirling sideways, hanging upside down, swinging gently or rocketing to the sky. At some locations, passengers use touchscreen terminals to customize their own ride based on height, age and thrill tolerance.

- **REEM* by Pal Robotics***
  Intel Atom and Intel Core processors power this humanoid robot, which features a mobile-wheeled base, navigation software, sensors and cameras that enable it to find its way autonomously around objects. The touchscreen interface on REEM can be used for multimedia applications such as map display, videos and presentations. Applications for tour guidance, entertainment and cargo transportation make the robot ideal for environments such as airports, hospitals, hotels, trade shows and shopping malls.

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As robots continue to require high levels of computing capabilities such as autonomous navigation and vision processing, Intel is focusing on the progress in computing performance. A rich ecosystem is engaged and available to support technology developments in relevant components such as batteries, motors and sensors.

Examples of innovative robotics projects-in-progress include:

- **Hexapod by Matt Bunting at the Robotics and Neural Systems Laboratory***
  In 2009, an electrical engineer student at the University of Arizona's Robotics and Neural Systems Laboratory designed an Intel Atom processor-based spider robot with walking algorithms that enable the robot to learn on its own how to move autonomously, even if one of the legs becomes inoperable. The robot also features a camera that enables the robot to track objects.

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