Breakthrough Technology Alert

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The $66 Billion Robotics Revolution

There are truly exciting developments afoot in the field of robotics. We are starting to see applications for robot technology gaining steam in the market. To illustrate, according to the Japan Robot Association (JARA), the consumer robotics market is projected to reach $24 billion this year and balloon to $66 billion by 2025. By comparison, the digital music market was $5 billion in 2007 and will be about $15 billion this year.

Personally, I think that the JARA's long-term estimate is actually pessimistic. Bill Gates is on record for predicting that by that year, personal robots will be as common as computers are today. If he is even half right, investors who get in on promising robot techs today will be fantastically compensated for their vision and patience in the long run. Investing in the next wave of robotics now will be like buying Intel, AMD, Apple and Microsoft in the 1980s.

Granted, the Great Recession has dealt temporary blows. A mainstay of the robotics industry has been assembly line machines for the automobile manufacturers. This sector is currently down. The overall robotics industry, though, is diversifying.

The automotive industry itself gives a good example of innovating during downturns. During the Great Depression, automobile sales plummeted. Crucial improvements in automotive technology, like fully automatic fluid transmissions and hydraulic brakes, were made, however. When the Depression ended, motoring was revolutionized. Profits and sales went up, along with share prices.

Robots are already being used for dangerous jobs that humans would rather not do. I've already written about iRobot's PackBots being employed by the U.S. military. Recently, the U.S. Commerce Department decided to fund a project with Fibrwrap Construction Inc. to develop robots able to repair aging water transmission pipelines from the inside. The R&D costs are more than justified by doing away with the need to tear the infrastructure out of the ground for repairs.

Berkeley researchers are developing small inexpensive robots that can enter collapsed buildings to find survivors after earthquakes. On the domestic front, iRobot recently announced it has sold more than 5 million Roomba robotic vacuums. This is the bestselling consumer robot in history.

The economics of robotics is based on one simple fact: While cost of production for goods generally declines over time, prices for services generally fall less or not at all. Your computer costs a fraction for the performance you receive compared with two decades ago. The technician who repairs it, however, has probably raised prices.

Similarly, food prices have fallen steeply, due to improved agricultural technologies.

This includes automation technologies that are, in fact, robotics. From John Deere to Alice-Chalmers, from balers to combines, automated ag equipment has drastically reduced what we have to pay to consume our daily bread. Nevertheless, we have only scratched the surface of the benefits robotics will bring to many areas.

Today, health care services have proven resistant to price declines partly because of labor costs. Improved robotic automation is one of the fastest ways to increase productivity and reduce labor costs. With the leading edge of the boomer generation entering retirement, the financial incentives for improved robots is enormous.

We're not only talking about cutting-edge remote diagnostics and surgical procedures. Much of the cost of elder care is in simple housekeeping and personal services. Families that want to keep older members out of assisted care facilities and closer to home will increasingly look to improved robotics for help.

The Japanese, in fact, know this well. The famous Japanese enthusiasm for humanoid robots is often scoffed at, but they will tell you there is a logic behind their efforts. More than a fifth of Japan's population is over 65 years old. A major thrust of Japanese investment is aimed at developing robotics capable of providing the sorts of care that now depend on human workers. With a dwindling work force and an increasing demand for basic care in homes

It's ALIVE!

My associate Ray Blanco and I recently spoke with Martin Spencer, president of one of the robotics companies we are tracking. His company, GeckoSystems International Corp. (GCKO:PINK SHEETS), is focused on the vision of robotically assisted health care. For more than a decade, Spencer has worked on technologies that would enable his dream of personal care robots. Now, GeckoSystems is starting to demonstrate those technologies in marketable robots.

According to Spencer, the biggest robotics problems are not hardware related. They involve software or artificial intelligences (AIs). His flagship robot, called CareBot, has advanced modular AI and a proprietary compounded sensor system that allow robots to move about the typical home landscape.

Unlike other robot designs that seek to reduce sensor inputs to cut down on computer processing demands, Spencer says GeckoSystems' CareBot is sensor loving. This property is necessary if a viable multipurpose self-directed robot is to succeed. The reason, he says, is that multiple inputs help give the robot a better reading on its environment. For example, when you are driving a car, you receive inputs not only through your vision. You also process information through the sensing of acceleration or deceleration, engine and road vibrations, noises from nearby cars and even impacts.

Being able to use multiple sensor feeds is particularly important in a robot that needs to move about the home on its own. The home, Spencer says, represents the

most challenging environment for a mobile robot. If a robot can navigate the chaotic environment of the average home, it is capable of operating in a wide variety of commercial and industrial environments.

The CareBot also has an AI module designed for human/robot interactions. This module, called GeckoChat, can respond to voice requests, create voice reminders and even engage in word games with a human being. The beauty of GeckoSystems' AI platform is that it can run on common PC hardware and operating systems like Windows XP and Linux, keeping down costs. Spencer believes that, due to the high cost of assisted care, his CareBots can pay for themselves in a matter of months.

On the related surgery front, we are seeing advanced robotics making large strides. Breakthrough Technology Alert recommendation Stereotaxis (NASDAQ:STXS) has developed a unique remote magnetically controlled catheter that can be operated with minimal trauma to the patient. The company has posted strong revenue growth for 2009 compared with the previous year. Only a few days ago, it received FDA approval for the treatment of atrial flutter.

One advantage of surgical robots is the degree of precision they are capable of, much higher than even the steadiest surgeon's hands. We are closely following developments with other robotics companies and will add stocks from this sector to our portfolio in the future.

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