Clique here

by Niall McKay on 01 August 2000, 00:00

Categories: Archives - Magazine
Topics: clique

There is a class struggle at work in the U.S. robotics industry. It's really a case of white-collar computer scientists versus blue-collar engineers. The brains that build artificially intelligent robots for academia pooh-pooh the chumps that build muscle-bound dolts for industry. The engineers, on the other hand, view the academics' creations as smart but useless.

"Here at Carnegie Mellon we don't concern ourselves with dumb welding machines," said Carnegie Mellon professor of robotics William Whittaker a few years ago at a robot exhibition in Pittsburgh, offending many industrial robot makers. "We're building robots that are changing the world." Mr. Whittaker unwittingly belittled his industrial counterparts and fingered the problem that has hampered progress ever since Robby the Robot got *Lost in Space.*

Robot snobbery.

Some even believe that the rift is responsible for America's decline as a robotics superpower. Just ask Henry Thorne, a former General Motors engineer and the founder of home-robot manufacturer Probotics. "I spent five years of my life at General Motors building those dumb welding machines," he says. "We saved GM millions of dollars, improved U.S. industry, and rescued employees from years of back pain."

So Mr. Thorne resents Mr. Whittaker's comment. At the Pittsburgh exhibition, Probotics displayed an industrial robot that could shoot a ball at a basketball hoop and score every time. So what if the robot isn't that bright? It will never let you down. "Get industrial robotics wrong and you can cost your company billions of dollars," says Mr. Thorne.

But Mr. Whittaker has a point. He's developing technology that really will change the world. "My expertise is field robotics, which doesn't occupy itself with painting cars or stuffing circuit boards," he says. His current research includes building robots that search for meteorites in Antarctica, map the structural damage at Chernobyl, and scrutinize the National Aeronautics and Space Administration's space shuttle for faults.

But for every Mr. Whittaker there's someone in industry who doesn't believe academia can produce a robot that can do a job properly and reliably. "It's much easier to invent a product that is never going to make it to the production line than it is to create one that will run error-free for five or ten years," says Gary Rutledge, vice president of Fanuc Robotics North America, a subsidiary of the Japanese industrial robotics manufacturer Fanuc (OTC: FANUF).

Surely all these people are from one big robot family. So why the divide? Typically, those in academia come from a computer-science background and use software programming and artificial intelligence to build smarter robot brains. They are concerned with what robots think. Those in industry come from an engineering background and use mechanical engineering to build robots that can lift, bend, shape, and, of course, weld and paint. They are concerned with what robots do.

WELD IN CONTEMPT

"I have to admit that robot snobbery exists," says Charlie Duncheon, former president of the Robotics Institute, a robot-industry trade group, and senior vice president of sales and marketing for Adept Technology, a company that builds robots for the circuit-board manufacturing industry. "We think that the academics don't know how to get their hands dirty; they think that we're a bunch of bubbas."

Mr. Duncheon believes that this rift may have contributed to the United States losing its position as the world leader in robotics development to Europe and Japan. In the early '80s there were more than 400 robot manufacturers in the United States, including companies like IBM and General Electric. By 1986 there were only about a dozen left. Last year, the Japanese robotics industry was worth over $2.2 billion, while the U.S. robotics industry was worth $1 billion, according to the International Federation of Robotics, a robot-industry trade association. Now Japanese companies like Fanuc, Matsushita, and Mitsubishi and European companies like Asea Brown Boveri and Kuka dominate the industrial world. "There is a much tighter relationship between industry and academia in Europe and Japan," says Mr. Duncheon.

In the United States, many of the most ambitious research projects take place in the academic environment. Think Massachusetts Institute of Technology's robotic fish, Robo-pike, Carnegie Mellon's vision-guided robotic helicopter. In sharp contrast, Japan's most ambitious projects come directly from the research departments of major corporations. There's Sony's Aibo robotic dog and Honda's humanoid robot that can walk, talk, and play football.

A robotic dog may seem like a particularly useless item to industry, but Aibo uses technology that may one day end up being useful to manufacturing: it has the senses of touch, hearing, vision, and balance. It will be a long time before Honda's Humanoid robot becomes a Robocop, but it's a step in the right direction. So much so that Honda contracted the world-renowned Stanford Research Institute in Palo Alto, California, to assess the Vatican's views on the ethical implications of a humanoid robot.

Perhaps the question Honda should be asking is: Would such a robot be accepted and loved by its fellow robots?

Considering the fact that the robotics market is small potatoes -- an estimated $3 billion to $5 billion worldwide -- our less glamorous industrial friends are very important. Without them, the price of televisions, stereos, computers, and of course cars would not have dropped over the last five years. And without robotics' contributions to the field of microelectronics, we'd most likely be walking around with brick-size cell phones glued to our ears.

Still, there's nothing like commerce (Marx would call it greed) to bring two worlds together. Your average academic is only too willing to exchange his white coat for "plumber's butt" when there's a buck to be made. Likewise, once a technology is ready for prime time, the industrial folks put their prejudices aside and get out their checkbooks.

LABOR UNION

Many believe that these two worlds will come together in the same way that software companies and university computer science departments have joined forces on software projects during the last few years. By all accounts, this will happen quite soon, since there are a number of technologies in the pipeline.

Robot eyes (machine vision algorithms) are improving all the time, and robot ears (speech-recognition software) are approaching a state of usability. Robot voice (speech synthesis) is already in place. Low-cost processing power will improve artificial intelligence and enable robots to learn from their mistakes. There's also global positioning satellite technology that will allow machines and their owners to know exactly where they are in the world. And software like Windows NT is making it easier to build control systems that don't take a rocket scientist to operate.

According to Mr. Duncheon, these robotics technologies will also bring a new era in custom manufacturing. "But this stuff is not easy," concedes Mr. Whittaker. "It's too easy to underestimate the complexity behind the steel."

Still, one thing is certain. The robotics industry can only get bigger, and as the cash starts to flow, a new romance will likely blossom between the academic and industrial factions. After all, the word robot comes from the Czech *robota*, meaning forced labor.

Write to letters@redherring.com.