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Revenge of the Frosh-Seeking Robots

By Nick Schulz

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The smartest college kids are rushing to major in economics. NICK SCHULZ shows how Microsoft is trying to lure them back to computer science.

Rich Karlgaard, the technology entrepreneur who is publisher of Forbes, tells the story of a trip he took with Microsoft's Bill Gates in the early 1990s. On the flight, he asked Gates, "Who is your chief competitor?"

"Goldman Sachs" was Gates's surprising reply.

Gates went on to explain that he was in the "IQ business." Microsoft needed the best brains available to make top-shelf software. His primary rivals for the smartest kids in America were elite investment banks such as Goldman or Morgan Stanley.

"Microsoft must win the IQ war," Gates said, "or we won't have a future."

If trends hold, then Microsoft's future in the war for IQ looks bleak. The brightest students these days are headed into finance, but Microsoft is fighting back, targeting colleges with an innovative strategy. The answer may be a little robot.

First, what do the trends say?

Gates says he's in the 'IQ business,' and his rivals for the brainiest students in America are the elite Wall Street Investment banks.

Recent enrollment figures are ominous. The number of smart kids studying computer science peaked a few years ago and has dropped dramatically since. The number of new computer science majors today has fallen by half since 2000, according to the Higher Education Research Institute at UCLA. Merrilea Mayo, director of the Government-University-Industry Research Roundtable at the National Academies, says the drop-off was particularly pronounced among women.

Meanwhile, elite schools are reporting that the number of economics majors is exploding. For the 2003–2004 academic year, the number of economics degrees granted by U.S. colleges and universities increased 40 percent from five years previously. Economics is seen by bright undergraduates as the path to a high-paying job on Wall Street or at a major corporation.

To respond to the fall-off in computer science interest, the brass in Redmond, Washington, turned to Microsoft's research division. Modeled on the great industrial R&D facilities in business history, such as Bell Labs and Xerox PARC, Microsoft Research is a 700-person division within the company. Comprising a series of laboratories

around the world, it labors to push the frontiers of computer science. That goal is jeopardized if it can't attract the brightest young men and women.

The Research staff first puzzled over what was driving the decline in interest in computer science. Many students choose a major based on perceptions of how helpful it will be in finding a well-paying job after graduation. So the bursting of the dotcom bubble a few years ago has likely played a role in reducing interest in information-technology careers. David Patterson, who has taught computer science at the University of California at Berkeley since the 1970s, also cites "the expected negative impact of offshoring information-technology jobs in North America and Europe."

But the Research staff put its collective finger on something more fundamental. Computer science, as it is currently taught in U.S. colleges, is suffering an excitement deficit. It is critical to make the first experience students have in computer science compelling and linked to real-world results. Too often, American colleges and universities don't do that.

The way computer science is taught in colleges and universities, says Bryan Barnett, lead program manager for Microsoft Research, "turns kids off almost immediately." They typically spend a year learning basic theoretical concepts and code syntax. There's little concrete to show for such work.

Within the first weeks of a class, freshmen will be able to write elementary code that prompts the robot to do simple tasks like drive forward and back.

To address this problem, Microsoft Research formed a partnership with Bryn Mawr, the venerable liberal-arts women's college near Philadelphia, and Georgia Tech, a traditional technical university. The three jump-started a \$2 million pilot program called the Institute for Personal Robots in Education that is developing an easily programmable tabletop robotic device to introduce to first-year computer science students.

The prototype I saw in May looks like a miniature space-age chariot, with two wheels and a Bluetooth wireless receiver on top. The developers want to keep the cost under \$200 and offer it in college bookstores with a first-year textbook.

Within the first weeks of a class, students will be able to write elementary code that prompts the robot to do simple tasks like drive forward or back. But even simple code-writing with immediate, physical results like this can have an impact that energizes students. Or so it is hoped. Eventually, students can write more complex code—programming their personal robots to emulate a moth.

This fall, the team expects to have 1,000 students using the robots, and in 2008 the developers should have the personal robots in hundreds of American computer science departments.

In the meantime, because computer companies can't find homegrown talent, they have to search abroad. Consider H-1B visas that allow U.S. businesses to sponsor skilled foreigners to come work here. In April, on the first day applications were accepted, the government was deluged with over 150,000 for 65,000 permitted spots.

America's education system isn't producing enough supply to meet market demand for IT talent. Microsoft is hoping that initiatives like its robotics-in-education effort can reverse recent trends and help coax some brains away from finance and into science. Future innovation—and perhaps U.S. economic growth—may hinge on the robots' success.

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