A Techie, Absolutely, and More

Jamika Burge is heading back to Virginia Tech this fall to pursue a Ph.D. in computer science, but her research is spiced with anthropology, sociology, psychology, psycholinguistics - as well as observing cranky couples trade barbs in computer instant messages.

"It's so not programming," Ms. Burge said. "If I had to sit down and code all day, I never would have continued. This is not traditional computer science."

For students like Ms. Burge, expanding their expertise beyond computer programming is crucial to future job security as advances in the Internet and low-cost computers make it easier to shift some technology jobs to nations with well-educated engineers and lower wages, like India and China.

"If you have only technical knowledge, you are vulnerable," said Thomas W. Malone, a professor at the Sloan School of Management at Massachusetts Institute of Technology and the author of "The Future of Work" (Harvard Business School Press, 2004). "But if you can combine business or scientific knowledge with technical savvy, there are a lot of opportunities. And it's a lot harder to move that kind of work offshore."

Ms. Burge's research, for example, is in a hot niche called computer-supported cooperative work, which studies the ways people use technology to communicate and collaborate in work groups and social networks. She spent the summer as a research intern for I.B.M., and her job prospects seem bright.

On campuses today, the newest technologists have to become renaissance geeks. They have to understand computing, but they also typically need deep knowledge of...
the school’s animation research lab. And they tend to focus less on the tools of technology than on how technology is used in the search for scientific breakthroughs, the development of new products and services, or the way work is done.

Not all of them are even headed for computer careers. Many are going into medicine, law, media and arts as well as other scientific fields.

For people who stay in computing, the job outlook is brightest for those skilled in the application of technology. While jobs in categories like programming have declined since 2000, according to the Labor Department, the need for information technology experts has not.

In fact, jobs that involve tailoring information technology to specific industries or companies, like software engineers who make applications and specialized systems, have grown. Total employment among information technology professionals, the government reports, reached nearly 3.5 million by the end of last year, surpassing the previous high in 2000, when the technology investment boom peaked.

At the same time, the march of computing is rippling across all academic disciplines. Even as computer science students are being encouraged to take more courses outside their major, students in other disciplines are finding more often that they need to use, design and sometimes write computer programs.

Several universities, for example, are developing multidisciplinary courses in "services science." The idea is to combine research in the social sciences, management, engineering and computing to pursue insights, innovations and increased productivity in the huge services sector of the economy, which now employs more than 80 percent of American workers. The University of California, Berkeley will offer a services science graduate course in the coming academic year.

Of course, such multidisciplinary shifts are still predicated on a solid grounding in computing. And there are worries that too few students are getting a technical education. While the need for technical expertise is growing, the number of students choosing computer science as a major is 39 percent lower than in the fall of 2000, the last of the dot-com bubble years, according to the Computing Research Association.

This trend has troubled Bill Gates, the co-founder and chairman of Microsoft, who traveled to several elite universities in a campaign-style tour in the spring of 2004 to stir up enthusiasm for computer science. He plans another campus tour this fall.

"There isn't the buzz and excitement about computer science that there should be," he said. "We're on the threshold of extraordinary advances in computing that will affect not only the sciences but also how we work and our culture. We need to get the brightest people working on those opportunities."

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