Special Issue on Women and Minorities in Information Technology

The revolution in information technology (IT) has had a profound impact on the technological progress, globalization, and growth of the U.S. economy. The consequences of IT are part of what has been called the information age, information society, digital era, or information-based economy. IT has contributed to America's structural shift from manufacturing to a service economy. Further, the IT-producing sector has been growing faster than the economy as a whole. IT has also contributed to an increased demand for labor, as well as an overall skill upgrade in the workplace. The U.S. Bureau of Labor has projected that between 2000 and 2010, the number of IT-related jobs would grow over 80%, exceeding an overall job growth of about 15%; science and engineering expects job growth of about 47%.

While the IT-based economy is expanding, women and minorities are underrepresented in U.S. IT education as well as in the American IT workforce. Women make up 51% of the U.S. population and 47% of the U.S. labor force, but women comprise only 27% of U.S. computer/math scientists. Since the early 1990s, the percentages of women in most science and engineering occupations have gradually increased except in computers/math in which the percentage of women

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declined about 4% between 1993 and 1999. The percentage of women earning their bachelor's degrees in IT-related fields has been dropping steadily since the mid-1980s in contrast with the general trends in graduation rates as well as those in science and engineering. For instance, women earning baccalaureate degrees in computer science peaked at 15 126 in 1986 and came down to 7063 by 1995. Since then the number has stabilized. Of incoming freshman in 2002, only 0.7% of women planned to major in computer science compared to 4.2% of men. At the graduate level, higher percentages of men earn computer science degrees (4.5%) as compared to women (1.4%).

Underrepresented minorities (African-Americans, Hispanics, and native Americans) make up 24% of the U.S. population and over 21% of the U.S. labor force but comprise less than 8% of U.S. computer/math scientists. Further, a bachelor's degree is more likely to be the highest degree achieved for underrepresented minority computer/math scientists than for white or Asian computer/math scientists. Among the small number of underrepresented minority students pursuing higher education, a larger percentage tends to earn degrees in the social sciences, psychology, and biological sciences than in computer science. For instance, from 1985 to 1999, underrepresented minorities earning bachelor's degrees increased only by 1% annually in computer science; in contrast, the annual increase for the social sciences was almost 10%. Trends for master's degrees show only modest growth in computer science (from 305 in 1985 to 583 in 1998) for underrepresented minorities. Underrepresented minorities are earning doctoral degrees in computer science starting at such a low base that they are barely visible on a graph compared to other racial/ethnic groups. For instance, in 1999, whites earned 854 doctoral degrees in computer science/math, Asians earned 145, and underrepresented minorities earned 59.

If we are to improve the representation of women and minorities in IT education and the IT workforce, we

have to identify factors that deter women and minorities from pursuing education in IT and joining the IT workforce. This special issue is a humble attempt in that direction. It's purpose is to raise discussion.

In this issue, Aspray gives a short history of the important role the Computing Research Association has been playing to promote diversity in IT. Wardle presents government initiatives by the National Science Foundation to improve the status of women and minorities in IT. Margolis et al. focus on disparities in IT education at the high school level by race and ethnicity. Katz et al. deal with race and gender differences in computer science learning at the undergraduate level. Cohoon and Baylor address the issue of women's enrollment in graduate computer science programs. Leggon focuses on often-neglected populations, African-American and Hispanic women, in IT. Galpin et al. give a global perspective by studying the relationship between self-efficacy and participation in IT in South Africa.