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As a computer science professor, my biggest current challenge is the decline in students wishing to major in computer science. The numbers have always been small at Mills, which is a women's liberal arts college. Current data suggests that women, always underrepresented, are leaving the field even more than men.

Shifting perspectives, the problems are:

- Students are not taking computer science courses so will not develop the valuable skills (such as programming), ways of thinking (logical and algorithmic), and perspective (such as an understanding of Moore's Law and the challenges of artificial intelligence). This limits their education.
- Society will not have as many workers and citizens even minimally educated in computer science.

In the past few years, my computer science courses have had fewer than ten students. Most recently, my Compiler Design course was cancelled for only having a pre-enrollment of three students. With these low enrollments, if a computer science professor were to leave Mills, we would probably lose the position.

Only one of my classes is consistently over-enrolled: Robots, Persons, and the Future, which is an interdisciplinary class without prerequisites for students in any major. In the course, students build and program Lego Mindstorm robots, read past works of futurism (including Malthus and Vannevar Bush), learn about artificial intelligence (including the original paper about the Turing test and science fiction), and read current works of futurism, both utopian and dystopian (including Kurzweil, Drexler, and Bill Joy). I believe the class has been very successful. Specifically, since students think robots are cool, I have reached many students who would not otherwise take a computer science course. A few of them go on to take more computer science as a result of the course. All of them leave with a better understanding of computer science, including the history and future of computing and its effects on society. It is also beneficial for the majors.

Typically, I have taught Robots, Persons, and the Future to juniors and seniors. This spring, I will teach it to sophomores. I hope that moving it earlier in students' education would increase their ability to take subsequent computer science courses.

To generalize from my experience:

- We need to actively recruit students who have not considered CS as a major by creating classes based on their areas of interest (e.g., robots, artificial intelligence, science fiction, and futurism). This enables students to make an educated choice on whether to take more CS courses.
- We need to identify the key ideas of computer science and infuse them into interdisciplinary courses so that they reach students who do not major in CS.

This is not a cure-all, but it is the best direction I have been able to think of. Possible barriers include:

- Computer science faculty unable or unwilling to teach non-majors.
- Administrations reducing CS staffing due to the shortage of majors.

Some ways that the NSF could encourage interdisciplinary courses include:

- Assisting in developing curricula for such courses (through dissemination and course development grants).
- Providing funding for CS faculty to co-teach courses with non-CS faculty.
- Enabling CS faculty to take courses in other departments to better create interdisciplinary classes. (Biology is an obvious area of opportunity.)

Mills is one of the few schools to offer a graduate program in Interdisciplinary Computer Science¹. It has two goals:

- Providing an entry into the CS pipeline for college graduates (mostly women) who developed an interest in CS after majoring in another, usually non-technical, field.
- Developing people able to apply CS to other disciplines.

Unfortunately, we have had trouble attracting students to the program, despite its success for the students who attend. We are evaluating how to make the program more attractive.

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¹ Sheila Humphreys and Ellen Spertus, "Leveraging an Alternative Source of Computer Scientists: Reentry Programs". *Inroads -- SIGCSE Bulletin* (Special Issue on Women and Computing), Vol. 4, No. 2 (June 2002).