



In Pursuit of Cross-Cultural Computer Accessibility

Sarah Airey (B.S.Cp.E., '01) came to Virginia Tech to learn how computers work. She is leaving Tech to discover how to make computers accessible to all individuals and communities worldwide.

Airey is one of 40 undergraduates in the country who have been awarded the prestigious British Marshall Scholarship for a two-year graduate program in the United Kingdom. "My graduate studies will focus on computer speech and text processing, which is a subsection of artificial intelligence. I'm interested in applications such as real-time translation,

where people of different languages can converse, or the Internet could be translated into a local language," she said.

She suspects that after earning a master's degree in the UK, she will pursue a Ph.D. "I'm interested in contributing to the research in the field," she said. "I'm also interested in what I consider to be the policy aspects of computer accessibility. Accessibility is not just an issue of technical design, but also of cultural and political perspectives. I hope that with a background and understanding of the technical capabilities, I can contribute to the overall progress."

Computers in Ghana

Airey's interest in computer accessibility was sparked by spending last summer in Ghana working on computer projects across the country. "I went to Ghana because of an interest in African art," she said. She spent the summer traveling around the country helping different communities with their computer projects.

"There is a sentiment in that country that computers are important," she said. She worked with a number of schools in their computer labs, helped one school design a web page, and taught some post-secondary students about the

Internet and programming. "I was there to help them learn how the computer worked and how to control it."

Another project involved setting up computers for e-mail at two towns in the north that work with the Binaba shop in Roanoke. The Binaba Shop sells African artwork and sends the money back to the village for a hospital that is being built there. "That was a fascinating project," Airey said. "Taking the computer to people who have never worked with it before. They have never had exposure to the VCR, or other similar technology. Jumping from low tech to the computer age is a big jump."

Airey said she learned many lessons about computer accessibility. "Computers as they are today may not be designed to solve the problems of a country like Ghana. Computers are designed for us in the United States." She said the biggest difference is in infrastructure. "We are not concerned about data size because we have high-speed connections." Even more important is a reliable supply of power. "Try running a large program with fluctuating power," she said.

Airey met a village chief who was implementing an AIDS education program and incorporating local healers. "I know that other countries have similar programs. This was the first time I saw that the computer could provide a way to help with a significant problem. It is not all hype. These people have serious issues with medical care and food supplies, but if a computer can offer access to information and a way to connect to others doing similar projects, then computers can be tools to address basic needs."

Airey's Ghanaian experience sparked a keen interest in the idea of interface. "How do you create things that people across many cultures can understand?" she

asked. She described how teachers in Ghana have trouble getting appropriate software for students because of instructions that contain cultural references like fire engines and baseball. "Getting a home run means nothing to a culture that does not play baseball," she said. "Also, the language for computers is English or other world languages. How do you make African languages on a computer? How can we introduce technologies that do not force these countries to become what we are? How do they keep their traditions but still take advantage of technology?"

The Freedom to Pursue Individual Interests

Airey had been drawn to Africa by an interest in art and returned home with questions that could take her years to answer. "Having the Bradley Scholarship allowed me to veer from the standard path," she said. "Knowing that there were people who had confidence in me and supported me, allowed me to spend the summer in Ghana instead of an industrial internship. It freed me to make



Sarah Airey (CpE, '01) with traditional Ghanaian doll.

my education better."

Airey did not get interested in computers until later than most of her computer-engineering peers. The first time she used a computer extensively was in the 10th grade. "I realized I didn't have a clue about what went on inside those machines. I was interested and keenly aware that I did not know how they worked. That is when I decided to become a computer engineer."

After making a four-year commitment to finding out how computers work, Airey enjoyed her two microprocessor courses. "It was satisfying to fulfill my original reason to pursue computer engineering. By then it was not my only goal, but it was fun to have it realized."

Airey said she also enjoyed her courses in operating systems and data structures, where the professors made an effort to lay out the big problems that are yet to be solved. "It appealed to us students that if we could solve these problems, we could get a lot of money," she said. "It was also nice to see that all the problems have not been solved, that there is still something for our generation to contribute."

In summarizing her Tech experience, Airey was impressed by the care that her professors showed with attention to individual students, even in the big classes. "I was blown away with their willingness to be available and answer questions and direct us to explore ideas we were interested in. It definitely exceeded what I had expected."

Airey's interests in college have drawn her to computers, art, and Africa. As she moves toward her studies in the U.K., she is looking forward to her next level: exploring diverse cultural perspectives in technological development.