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Non-Trivial Pursuits

By Dana Mackenzie

Twenty-five years ago, the first lesson I absorbed in graduate school—before I learned anything about geometry or class field theory—was the graduate student ethos: Thou shalt not have a life! I am not sure whether someone told me this explicitly, or whether it was my own panicky reaction to the fact that every other graduate student seemed to know more than I did. Perhaps I took my cue from role models like Paul Erdős, who seemed to live a fascinating life, even without any interests outside mathematics. The message seemed clear: Mathematics is its own reward. If you're serious about it, you shouldn't want or need to spend your time on other pursuits.

And so I renounced my favorite hobbies—chess (which I had played from the age of seven) and folk dancing (which I had started in college). I buried myself in the study of all that was good and pure, and I emerged four years later with a doctorate and a serious case of burnout. After graduate school, I resolved never again to put mathematics ahead of life. An excellent decision, as it turned out: Within the next five years I won two state championships in chess and met my future wife at folk dancing. But I always wondered whether I was shortchanging my mathematical career.

Can a successful mathematician have an equally rewarding avocation outside math, without sacrificing either? The answer, of course, is yes. "I believe that a large majority of mathematicians have at least one interest outside of mathematics," says Donald Lewis, former chair of the mathematics department at the University of Michigan. "But frequently they hide it from their col-

leagues." All too often, the first public recognition of a mathematician's "other life" comes in his or her obituary.

In the belief that mathematicians deserve a little *postmortem* recognition for their achievements outside the profession, I interviewed five people who have managed to balance their mathematics with substantive and rewarding avocations outside of math. These are their stories.

A Matter of Balance

In 1927, the year Charles Lindbergh flew across the Atlantic, a new dance craze took off in America, a high-energy swing dance that became known as the "Lindy hop." Seventy years later, the Lindy hop swept the country again,



Using the dance vocabulary invented by Sommer Gentry, subjects can interact better with the PHANToM robot, the personal haptic interaction device she's shown with here. Photos by Dorry Segev.

thanks in large part to a television commercial that showed young people bopping to the jazz tunes of the 1930s.

One of the people snared by the new/old fad was an applied mathematics student from Stanford University. "I went dancing literally every single night of the week, and days too on weekends," says Sommer Elizabeth Gentry, who is now a graduate student at the Massachusetts Institute of Technology. "Swing dancing gave me such an amazing high that I couldn't get enough." In 1999 she met her future husband and dance partner, Dorry Segev, at the national Lindy hop competition. By 2001 they were already the fifth best couple in the U.S., and the next year they won the British championship.

Gentry's favorite step in the Lindy hop, and also one of the most basic, is a move called the swingout. "It's beautiful because there's a moment when you're rotating around your partner," she says. "If it's done right, neither of you can balance alone. If you let go, you would fly apart."

Not only has she kept up her dancing in graduate school, but she has brought it into her research. Inspired by the wordless communication used by dance partners—a slight gesture or hand movement from the leader conveys to his partner what he wants to do next—she has been programming a robot to communicate with humans the same way. "You could use a robot as a trainer to teach a surgeon what move to do next in surgery," she says. "Or you can use a surgical robot as a follower: It could recognize what motion the surgeon is trying to accomplish, and after that help him do it." The result, like a dance, would be a coordinated operation that neither leader nor follower could accomplish alone.



MIT graduate student Sommer Gentry has integrated her passion for swing dancing into her research in robotics. Now a fourth-year Computational Science Graduate Fellow, Gentry credits the "wonderful" DOE fellowship for requiring her to take courses not only in mathematics and computer science, but also in engineering. It was in a course called *Space Biomechanical Engineering*, she says, that she began the work on human biomechanical control that ultimately led to her thesis topic.

Gentry won a Best Student Paper award at an IEEE meeting last year for her human-robot experiments. Meanwhile, she continues to teach and compete in swing dancing, which she plans to participate in for the rest of her life. "I couldn't have quit swing dancing even if I were ordered to," she says. "I really feel that living in balance is what makes you strong enough to face the graduate student lows of self-criticism and self-doubt."