

TECHNOLOGY

Sommer Gentry
and her robotic
dance partner**DANCE MACHINE**

As a championship swing dancer, Sommer Gentry knows that when her dance partner leads, he does so with touch cues, not words. Gentry, a graduate student in MIT's Department of Electrical Engineering and Computer Science, conducted experiments to test whether this kind of touch-based communication could be applied to human interactions with robots and recently won an IEEE award for her work. Her findings could prove useful in, among other things, robotic-surgery applications.

Gentry programmed a commercial desktop robotic arm to move in four sequences of circles and arcs to the beat of "New York, New York." Test subjects learned the sequences by holding the robot's "hand," then attempted to follow its lead as it strung the sequences together randomly. Gentry found that once the subjects recognized the moves the robot was performing, their response time fell to less than 100 milliseconds—less than the time it takes for a nerve signal to travel up the arm to the brain and for the brain to initiate a reaction. Gentry thinks this kind of communication could work well in applications such as surgery. A robotic device could be programmed, for example, to teach a medical student how to suture. The device could gently guide the student's hands through certain motions—weaving forceps, grabbing a thread, and pulling it tight—on specific beats.

Her next experiments will involve more complicated dance patterns and might give the robot a chance to make adjustments for the follower's errors.

L. BARRY HETHERINGTON (INSET), COURTESY OF SOMMER GENTRY (DANCE)