WHITING SCHOOL of ENGINEERING: NEWS

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Research Initiatives

Flexible Gold Circuits

Assistant Professor **Christopher Chen** (Biomedical Engineering), and team have developed a new electronic circuit, made from gold wire coiled in waves and encased in a chip made of a springy polymer instead of silicon. The wires are 20 times thinner than a human hair and the circuits can be stretched by over half their initial length. The potentials for such flexible circuitry are enormous and Chen speculates that wiring like this could be used in everything from sports clothing to monitor athletic performance to developing rubbery needles for Parkinson's disease patients, whose tremor are treated with electrical stimulation in the brain. Chen's work was featur in the journal *Nature*, Science Update Online.

Modeling Brain Processes

Associate professor **Reza Shadmehr** (Biomedical Engineering) and colleagues have developed a new model to help understand how humans learn to perform complex movements through the brain's processing of motor commands. The results show that the brain builds models of the physical world through a combination of motor primitives. Their research i reported in the November issue of PLoS Biology.

Research Centers

Electronic Voting Concerns Continue

Avi Rubin, associate professor of computer science and technical director c the Johns Hopkins University Information Security Institute (ISI), continue to draw the public's attention to security concerns around electronic voting as primaries take place throughout the country this spring. In a report released last summer by Dr. Rubin, Dan Wallach, assistant professor of computer science at Rice University, and doctoral students Adam Stubblefield (JHU) and Yoshi Kohno (UCSD), the issues of electronic voting vulnerabilities and how hackers might tamper with the new voting machine began a national debate that remains heated.

In addition, this January Avi Rubin and colleagues brought national attenti to an Internet voting system (SERVE—Secure Electronic Registration and Voting Experiment) under development by the U.S. Department of Defense SERVE would have allowed online absentee voting for eligible overseas citizens. However, on the advice of Rubin and other experts analyzing the system, the government decided to abandon the plan due to security concerns.

In his graduate-level class at Hopkins, Security and Privacy in Computing, Rubin has students working on just these types of real-world problems. "A a society, we will have to start prioritizing security…users will have to know more about what's going on in their computers and vendors will have to