

Must Science and Religion Be Enemies? (see page 88)

SCIENTIFIC AMERICAN

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SUPER HURRICANES

page 44

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The MEMORY CODE

Learning to read minds by understanding how brains store experiences

Hijacked Cells

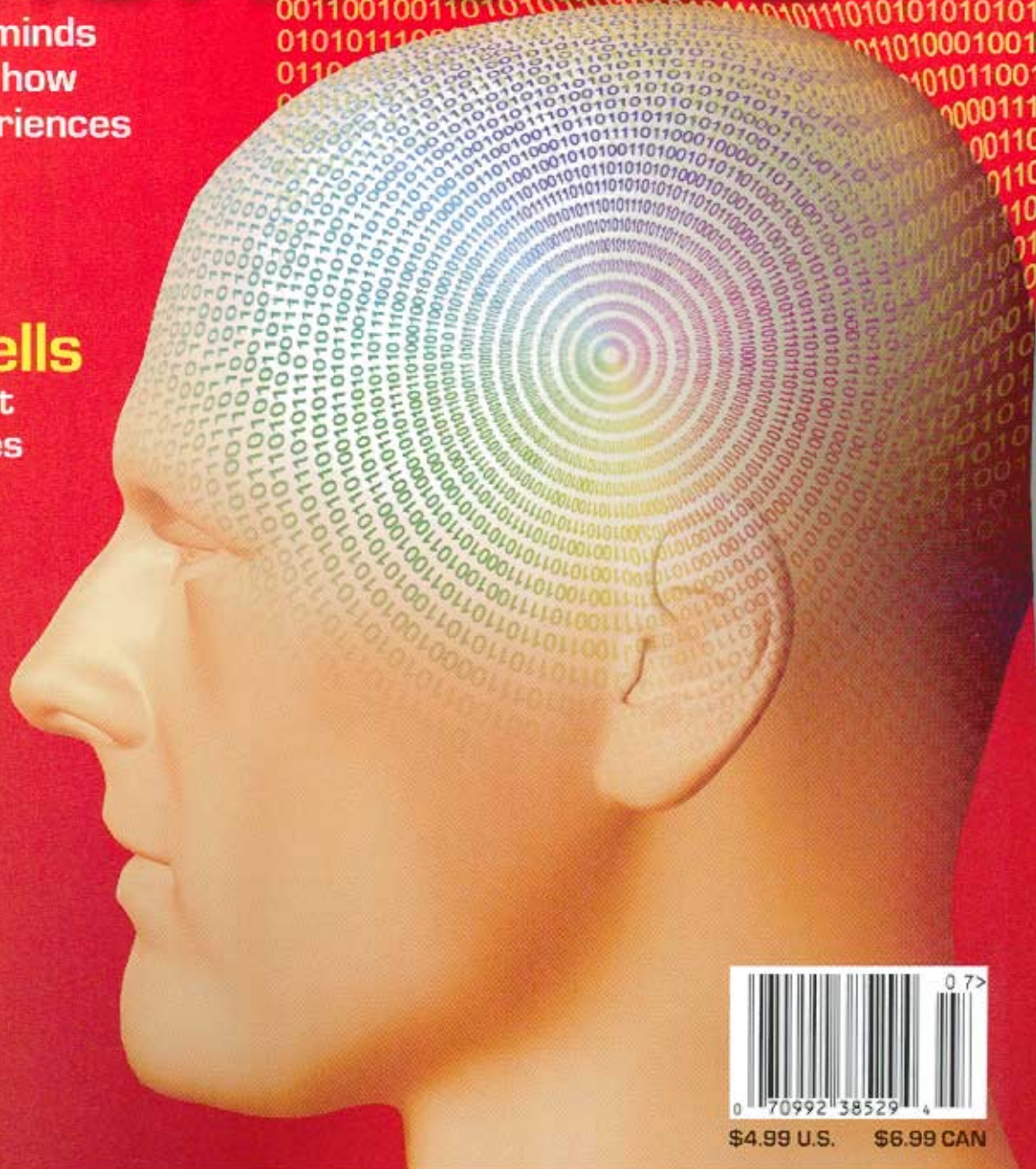
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INFO TECH

Jam Session

A design to block RFID tags **BY WENDY M. GROSSMAN**

Privacy advocates have fretted for some time about radio-frequency identification (RFID) tags and their potential for enabling detailed tracking of an individual's activities. Some tags are obvious, such as those used for E-Z Pass toll collection on northeastern U.S. highways; others are more insidious, such as those tucked inside U.S. passports and on the London Underground's travel cards. Rapidly expanding in use, such tags may soon even report the amount of material in recycle cans.

Melanie Rieback and her colleagues at Free University in Amsterdam are working on RFID Guardian, which they hope will enhance privacy: a portable, battery-powered personal firewall. The notion is that anyone ought to be able to see what RFID tags are nearby and who owns them—and then have the ability to selectively jam the readers. In this way, you could allow security—and no one else—to read your passport RFID chip.

Although RFID tags vary in size from a postcard to a rice grain, they all rely on built-in antennas, along with logic and memory circuits. Passive tags get their power from the reader that interrogates them and can be read up to about one foot away. Active tags have onboard batteries and can be perused 100 yards away or more. All

types have preset functions that prevent collisions—conflicts that arise when several tags respond to a query simultaneously.

Exploiting these anticollision protocols formed the basis of the first effort to create privacy enhancement for RFID, outlined in a 2005 paper by Ari Juels, chief scientist at RSA Laboratories in Bedford, Mass. His solution involved producing and deploying tags that would respond to all reader queries, making it impossible for a reader to determine what tags were present in the vicinity.

Rieback considered the idea brilliant but also saw shortcomings. One problem, she says, is that Juels's proposed tag had no power source and therefore could not respond to a reader if it were incorrectly oriented. Moreover, because each tag has only a tiny amount of memory, it could not store a consumer's preferences as to when to allow the tags to be read and by whom. Plus, if such policies were implemented on a tag that is widely distributed, finding and updating all those chips would be difficult.

Rieback reasoned that a battery-powered device would not share these limitations and could also scan and audit nearby tags and manage security protocols. For the past two years she and her team have been developing such a counter-tag, and



PERSONAL FIREWALL: Electronic readers of RFID tags, such as those in passports, could be blocked to prevent eavesdropping.

the device is currently in its third version. They hope to make enough of them to supply other research groups and companies, which might improve and commercialize the idea. The team also intends to release the hardware and software with an open-source license so that anyone can freely modify or add to it.

"The ultimate vision is that we could make a one-chip version of it," Rieback says. With that, she notes, the functionality could become integrated into a PDA or cell phone so that the output could be displayed on a portable screen—and privacy carried in the palm of the hand.

Wendy M. Grossman is based in London.

FORENSICS

Pieces of a Paranoid Past

A plan moves ahead to reconstruct East Germany's shredded secret police files **BY MICHAEL DUMIAK**

MAGDEBURG, GERMANY—In a boxy, windblown district in a workaday cathedral city on the Elbe River, a long warehouse sits near what was the regional post for the East German secret police, 90 minutes by train from Berlin. The warehouse

is stacked three stories high with bin bags, some 50 to a shelf. Archive chief Jörg Stoye noses one with his shoe. "Potato sack," he grins.

But the contents are much heavier than potatoes. The sacks contain millions of

shredded fragments snatched from lives during the Communist-run Deutsche Demokratische Republik (DDR, or German Democratic Republic). Some of the documents detail East German spying operations against West Germany, a natural