

HP Unveils Revolutionary Wireless Chip that Links the Digital and Physical Worlds

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HP today announced that its researchers have developed a miniature wireless data chip that could provide broad access to digital content in the physical world.

With no equal in terms of its combination of size, memory capacity and data access speed, the tiny chip could be stuck on or embedded in almost any object and make available information and content now found mostly on electronic devices or the Internet.

Some of the potential applications include storing medical records on a hospital patient's wristband; providing audio-visual supplements to postcards and photos; helping fight counterfeiting in the pharmaceutical industry; adding security to identity cards and passports; and supplying additional information for printed documents.

The experimental chip, developed by the "Memory Spot" research team at HP Labs, is a memory device based on CMOS (a widely used, low-power integrated circuit design) and about the size of a grain of rice or smaller (2 mm to 4 mm square), with a built-in antenna. The chips could be embedded in a sheet of paper or stuck to any surface, and could eventually be available in a booklet as self-adhesive dots.

"The Memory Spot chip frees digital content from the electronic world of the PC and the Internet and arranges it all around us in our physical world," said Ed McDonnell, Memory Spot project manager, HP Labs.

The chip has a 10 megabits-per-second data transfer rate – 10 times faster than Bluetooth wireless technology and comparable to Wi-Fi speeds – effectively giving users instant retrieval of information in audio, video, photo or document form. With a storage capacity ranging from 256 kilobits to 4 megabits in working prototypes, it could store a very short video clip, several images or dozens of pages of text. Future versions could have larger capacities.

Information can be accessed by a read-write device that could be incorporated into a cell phone, PDA, camera, printer or other implement. To access information, the read-write device is positioned closely over the chip, which is then powered so that the stored data is transferred instantly to the display of the phone, camera or PDA or printed out by the printer. Users could also add information to the chip using the various devices.

“We are actively exploring a range of exciting new applications for Memory Spot chips and believe the technology could have a significant impact on our consumer businesses, from printing to imaging, as well as providing solutions in a number of vertical markets,” said Howard Taub, HP vice president and associate director, HP Labs.

The chip incorporates a built-in antenna and is completely self-contained, with no need for a battery or external electronics. It receives power through inductive coupling from a special read-write device, which can then extract content from the memory on the chip. Inductive coupling is the transfer of energy from one circuit component to another through a shared electromagnetic field. A change in current flow through one device induces current flow in the other device.

Memory Spot chips have numerous possible consumer and business-based applications.

Some examples are:

- Medical records: Embed a Memory Spot chip into a hospital patient's wrist band and full medical and drug records can be kept securely available.
- Audio photo: Attach a chip to the prints of photographs and add music, commentary or ambient sound to enhance the enjoyment of viewing photos.
- Digital postcards: Send a traditional holiday postcard to family and friends with a chip containing digital pictures of a vacation, plus sounds and even video clips.
- Document notes: A Memory Spot chip attached to a paper document can include a history of all the corrections and additions made to the text, as well as voice notes and graphical images.
- Perfect photocopies: A Memory Spot chip attached to a cover sheet eliminates the need to copy the original document. Just read the perfect digital version into the photocopier and the result will be sharp output every time, no matter how many copies are needed, and avoiding any possibility of the originals jamming in the feeder.
- Security passes: Add a chip to an identity card or security pass for the best of both worlds --- a handy card with secure, relevant digital information included.
- Anti-counterfeit tags: Counterfeit drugs are a significant problem globally. Memory Spot chips can contain secure information about the manufacture and quality of pharmaceuticals. When added to a drug container, this can prove their authenticity. A similar process could be used to verify high-value engineering and aviation components.

Source: HP

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