

# Carnegie Mellon maglev haptic interface wins R&D 100 award

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A magnetic levitation haptic interface invented by Ralph Hollis, a professor in Carnegie Mellon University's Robotics Institute, is the recipient of a 2010 R&D 100 Award, presented by R&D Magazine to recognize the 100 most technologically significant products of the past year. Hollis and other winners, listed on the R&D Awards website, [rdmag.com](http://rdmag.com), will be recognized at an awards banquet Nov. 11 in Orlando, Fla.

The maglev haptic interface, under development in Hollis' lab since 1997, enables computer users to manipulate or interact with virtual or remote environments using their sense of touch. It provides highly realistic feedback so users can perceive textures, feel hard contacts and notice even slight changes in position. Users are working on applications for controlling remote robots and as a simulation technology for dental training and biopsy needle insertion.

The maglev haptic interface has a single moving part — a bowl-shaped device called a flotor that is embedded with wire coils. Electric current flowing through the coils interacts with permanent magnets underneath, causing the flotor to levitate. Users control the device with a handle attached to the flotor, moving it much like a computer mouse, but in three dimensions. Based on the interaction of the virtual objects being manipulated, corresponding signals are transmitted to the flotor's electrical coils to exert forces and torques to the handle that the user can feel.

The technology was developed at Carnegie Mellon with support from the National Science Foundation. A Carnegie Mellon spin-off, Butterfly Haptics LLC, now produces a commercial version of the device, called the Maglev 200, which was developed with the help of a grant from Pittsburgh's Innovation Works, a non-profit economic development group.

"The R&D 100 Awards have always represented some of the most innovative concepts to reach the marketplace in the past year," said Rita Peters, editorial director of R&D Magazine. "2010 is no exception, and we had a particularly strong field of entries for the judges to evaluate."

Since the award program began in 1963, it has identified a number of revolutionary technologies that went on to become household names, including the automated teller machine (1973), fax machine (1975), liquid crystal display (1980), Nicoderm anti-smoking patch (1992) and HDTV (1998).

Provided by Carnegie Mellon University

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