

# Mobile devices serve as own mice with optical sensing (w/ Video)

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(PhysOrg.com) -- The same inexpensive, but high-quality optical sensors employed in the common computer mouse can enable small mobile phones and digital music players to be used as their own pointing and gestural input devices, say researchers at Carnegie Mellon University's Human-Computer Interaction Institute (HCII).

By installing a pair of optical sensors on the back of a mobile phone or mp3 player, the researchers found that the entire device could have many of the same benefits as that of a computer mouse when the device was placed against a surface, a piece of clothing or the palm of a hand. This new input method, called Minput, responds to up-down, and side-to-side motions, like a [computer mouse](#), but also to twisting and flicking motions.

"Minput turns out to be a fairly intuitive way to navigate through menus or photo galleries on a device's display without fumbling with tiny buttons or obscuring a small touchscreen with your fingers," said Chris Harrison, a third-year Ph.D. student who developed the method with his faculty adviser, HCII Professor Scott Hudson. "Because we use a pair of sensors, it can respond to a wide

range of gestural commands, much like an [iPhone](#) or other multi-touch device."

Twisting a Minput-equipped device — a gesture that proved particularly popular with beta testers — might allow a user to zoom in or out of a photo or document, while flicking the device against a surface enables the user, for instance, to switch between photos or between photo galleries. But Minput also permits high-precision positioning — such as selecting a sentence of text from a paragraph — that would be difficult to perform on a small touchscreen or with other types of gestural input, where the size of the finger might occupy a majority of the screen.

Harrison presented a paper on Minput earlier this month at CHI 2010, the Association for Computing Machinery's annual Conference on Human Factors in Computing Systems in Atlanta.



Minput didn't require developing any new sensor technology, Harrison said. "The hard part was done

for us; optical sensors are already fantastically well-engineered. And at about a dollar apiece, they wouldn't add much to the cost of a mobile phone or music player," he noted. "We just use these sensors in a new and clever way."

For their prototype, Harrison and Hudson mounted two optical sensors on the back of a wristwatch-size television with a 1.5-inch-diagonal display. Computer processing is performed off-board by a laptop computer. But Harrison said the Minput sensors and processors could be readily miniaturized to fit inside small mobile devices.

**More information:** Project page:  
[www.chrisharrison.net/projects/minput/](http://www.chrisharrison.net/projects/minput/)

Provided by Carnegie Mellon University

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