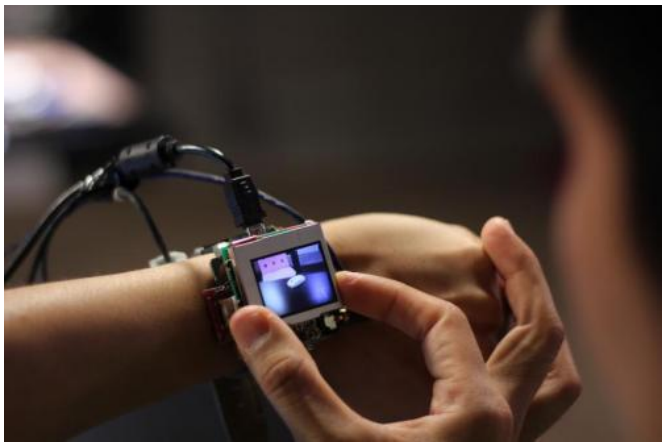
Carnegie Mellon prototype shows interface value of smartwatch

16 May 2014, by Nancy Owano



The smartwatch is an interesting form factor but a Carnegie Mellon team that is focused on interfaces noted its limitations and addressed the size challenge. Because the device is worn on the wrist, the sophistication of interactions that people can perform on it is limited. The team suggested a workable approach that can make the smartwatch capable of offering enhanced convenience in information access and retrieval. The Carnegie Mellon team came up with a smartwatch that uses the watch face as the multi-degree of freedom interface without having to occlude the screen with fingers.

The components of their prototype are designed in such a way that the user can twist, tilt, and click, all for enhanced control. To illustrate their approach, the group, Robert Xiao, Gierad Laput and Chris Harrison, walked viewers through a number of applications in their video. The group is from the university's Future Interface Group at the Human-Computer Interaction Institute. (The Future Interfaces Group [FIG] is an interdisciplinary research laboratory. Its site description reads "We create new sensing and interface technologies.")

The video demonstrates how simple tilts, clicks, and twists around the screen accomplish various tasks. These include setting an alarm, viewing a map, taking a picture, and checking out a calendar. Depending on the task and the motion, whether clicking or tilting, or twisting, one can bring up information on a highlighted calendar event, navigate through a music menu, and set a desired time for an alarm.

The group built their prototype, made the video, and they also delivered their paper on the watch at the ACM CHI Conference on Human Factors in Computing Systems in Toronto. "Expanding the Input Expressivity of Smartwatches with Mechanical Pan, Twist, Tilt and Click" by Xiao, Laput, and Harrison discussed the details of their prototype, which features a 1.5-inch LCD color display with a resolution of 280 x 220 pixels. Two sensors capture the interactions. The two sensors are connected to an ARM Cortex M3-based Maple Mini over an I2C bus. Data is sent via USB to a host computer, where a Java program processes the inputs and implements an interactive application. The graphical output of this application is sent to the smartwatch display

Quoted in *MIT Technology Review*, Carnegie Mellon's Chris Harrison, an assistant professor of human-computer interaction who worked on the project, said the researchers, in making the watch, tried adhering to some rules: it should not feel cramped to use; users should not have to lift their fingers from the screen while using it.

They wrote in their paper, "Our approach is inexpensive, potentially compact, and can complement existing inputs, such as physical buttons, touch and voice."

More information: chrisharrison.net/index.php/Research/Smartwatchface
www.figlab.com/

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