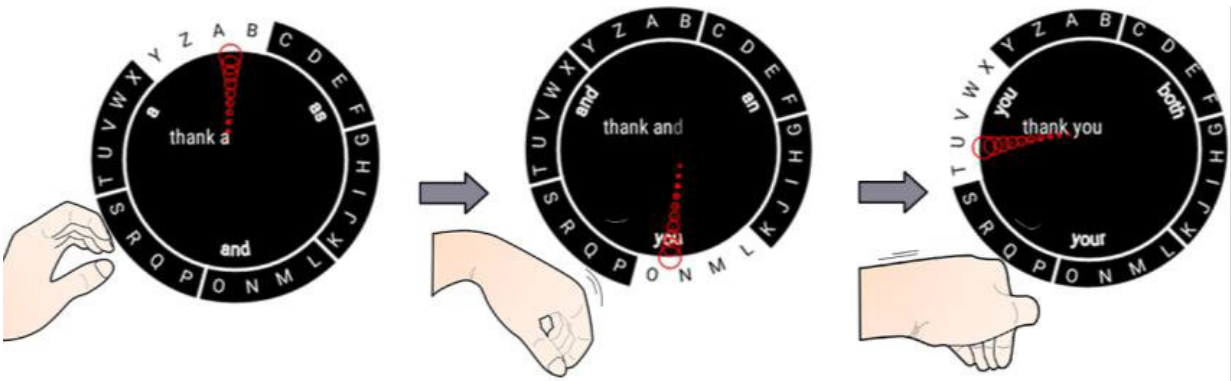


Researchers bring smartwatch innovations to CHI2018

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Entering text with simple wrist movements using the WrisText watch face.
Credit: XD Yang/Dartmouth College

Researchers from Dartmouth College will unveil developmental smartwatch technology at the ACM CHI Conference on Human Factors in Computing Systems (CHI2018). The watch innovations will be demonstrated during the event in Montreal, Canada running from April 21 through April 26.

The research is the latest on a long list of technical designs from Dartmouth's [XDiscovery Lab](#) that seek to increase the functionality of wearables while also adding to the overall user experience.

"Smartwatches help people access info 'on the fly,' but they are far from

perfect," said Xing-Dong Yang, assistant professor of computer science at Dartmouth. "Our aim is to eliminate the technical and practical barriers that keep people from using wearable devices. We look forward to presenting the future of this technology at CHI2018."

WrisText: One-handed wrist gestures for easy text entry

WrisText allows a user to compose text messages on a smartwatch without physically typing on the touchscreen interface. This enables easy text entry with the watch-wearing hand in instances when the other hand is occupied.

By simply moving the wrist in different directions, a user can answer a question with a quick "yes or "no" or even type out a more complex sentence.

"Watches are becoming more commonly used for text entry, but the process can still be awkward. WrisText provides an alternative for text entry that is quick, convenient and effective," said Yang.

The watch features a round face with an alphabetical keyboard that was found to be the most comfortable and accurate layout for wrist movement. An augmented wristband uses proximity and vibration sensors to transfer natural wrist motions into text entry. While entering text was difficult for users to learn at first, participants in a study became proficient with the system after only a few days.

The WrisText research paper earned honorable mention from CHI2018 and builds on an earlier innovation from the XD Lab that allows users to input non-textual gestures with the watch-wearing hand.

WrisText paper:

<http://www.cs.dartmouth.edu/~hci/project.html?title=WrisText>

Jetto: Lateral feedback becomes a force for smartwatch interactions

Dartmouth's Jetto provides more immersive interaction for gamers, movie watchers and other smartwatch users by allowing wearers to feel when virtual objects collide within the smartwatch.

While in an early stage of development, this technical achievement provides lateral force feedback that allows wearers to experience forces that impact the sides of a watch.

"Jetto mixes the physical and virtual worlds in a [smartwatch](#)," said Yang. "This mixed-reality experience leverages the unique quality of wearables to connect what users see to what they can feel."

Jetto is built on 3D-printed gears within a pneumatic system that is embedded in a custom watch case. The system's rotating air nozzle can control the location, direction, duration and magnitude of a virtual force experienced in a watch function to make the user feel something hitting the watch edge.

To demonstrate the technology during a research study, the Dartmouth team ran a variety of video games and video clips on Jetto to test the watch's performance when objects pushed or collided into the edge of the watch screen.

Jetto paper: <http://www.cs.dartmouth.edu/~hci/project.html?title=Jetto>



Provided by Dartmouth College

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