

Project Jacquard to weave interactivity into textiles

May 29 2015, by Nancy Owano

"Wearables" represents a broad-category of how we will interact with the digital world away from our laptop screens. It embraces arm bands, socks, bracelets, rings and watches. Google is now enhancing that spectrum, having done some serious playtime exploring fabric. Welcome to Project Jacquard, which Google announced at this year's I/O developer conference in California.

Under Project Jacquard, touch sensor technology is being woven into fabrics. Project Jacquard makes it possible to weave touch and gesture

interactivity into any textile, using standard, industrial looms. Google said that everyday objects such as clothes can be transformed into interactive surfaces. To that end, new conductive yarns have been created in collaboration with industrial partners.

The key ingredient is conductive thread. With it, one can weave a mesh. Brent Rose in *Gizmodo* said it "looks not unlike the matrix of sensors under your [touchscreen](#)." Rose said that while roaming around the floor of this year's Google I/O event, he got his hands on Project Jacquard—namely, something "nice n soft," which is a "fabric that can control your phone." Scott Stein, a *CNET* senior editor, also tried it out, saying Thursday that it was an "Interactive fabric" that can be used to control lights, music or more: Stein reported that "I did turn off lights, control music and make [shapes](#) dance on a monitor by stroking my fingers over a little square grid of cloth."

For a demo, a tablecloth with the woven tech was connected to different devices. "It worked basically just like a touchpad," said Rose. Stein similarly found it to be "like a capacitive touchpad, made of fabric."

Rose said, "I was also able to tap to turn on some Philips Hue bulbs. Swiping up/down [adjusted](#) the brightness, and swiping left and right changed the bulbs' colors. You can use it to play/pause/skip tracks on your phone's music player."

Can this kind of undertaking be made easily and at what cost? The thread can be manufactured at scale and woven on industrial equipment, said Rose.

Google said the yarn structures combine thin, metallic alloys with natural and synthetic yarns like cotton, polyester, or silk and the yarn is strong enough to be woven on any industrial loom. Google also said the miniaturized electronics capture touch interactions, and various gestures

can be inferred using machine-learning algorithms.

Captured touch and gesture data is wirelessly transmitted to mobile phones or other devices, said Google, to control a wide range of functions, connecting the user to online services, apps, or phone features. LEDs, haptics, and other embedded outputs provide feedback to the user, "connecting them to the digital world."

What's next? Google could move this into wearable clothing. Rose said, "it might even be possible to make a whole shirt out of the stuff, where the shirt acts as a micro-controller with various sensors (accelerometers, gyroscopes, pressure sensors, [heart rate monitors](#), etc) attached." Stein said, on Thursday, "Project Jacquard is part of what could be this year's big intriguing new announcement." Stein was correct. "Jacquard is a blank canvas for the fashion industry," announced Google on Friday. "Designers can use it as they would any fabric, adding new layers of functionality to their designs, without having to learn about electronics."

Beyond Google's Friday announcement, scientists have been steadily advancing their pursuit of what could be possible when threads intersect with electronics. Last year, Intel showed a smart shirt at a conference in California. The shirt's conductive fibers could [track](#) heart rates and deliver information to a smartphone. Nick Bilton in *The New York Times* reported that the shirt was designed in partnership with Taiwan-based AiQ Smart Clothing which focuses on the merging of electronics with textiles. The shirt used embedded sensors made from conductive fiber.

Earlier this month, a symposium took place at the Cornell Institute of Fashion and Fiber Innovation (CIFI), where fiber scientist Juan Hinestroza described his work to teach cotton "new tricks" and where student presenters' works included clothes made from optical fibers that strobe in response to music and workout gear that could give acoustic feedback if a [weightlifter](#) uses correct form. "We are growing a platform

for partnerships that can translate innovations at Cornell into commercial products in the fashion and apparel industries," said Jintu Fan, CIFFI director.

More information: www.google.com/atap/project-jacquard/

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