

Why Do We Have Fingerprints?

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The grooves in fingerprints enhance our ability to sense textures, according to a recent study. Image credit: Wikimedia.

(PhysOrg.com) -- Unlike most wrinkles on our bodies, which appear due to bending and stretching of the skin, fingerprints aren't the result of repeated motion. Each of us is born with a unique set of them, although scientists aren't exactly sure what purpose fingerprints serve.

One possible purpose of <u>fingerprints</u> is that they improve our <u>sense of</u> <u>touch</u>. In a recent study, scientists have investigated this idea by performing a series of experiments with artificial fingertips made of rubber-like sensors. The scientists compared the sensitivity between these grooved artificial fingertips and a smooth skin-like material, and



found that the grooved fingertips produced vibrations up to 100 times stronger than the smooth material when sliding against a slightly rough surface.

The researchers, from the Ecole Normale Superieure in Paris, explained that increased vibrations give us an enhanced sense of touch, especially for detecting textures. As you rub your fingers across a textured surface, your fingerprints specifically amplify vibrations in an optimized frequency range to stimulate the Pacinian corpuscles, which are nerve endings in the skin that detect textures. In turn, texture information allows us to identify objects by touch.

As the finding demonstrates, not only does our <u>nervous system</u> (the "software") play a role in tactile computation, but the physical characteristics of the body (the "hardware") also enhance the computation when sensing.

However, the research doesn't explain why everyone's fingerprints are unique, or why our fingerprints are typically arranged in elliptical swirls. The scientists suggest that the loop design may ensure that some ridges are always brushing perpendicular to a surface, no matter the orientation of the fingertips. In addition, the researchers predict that this work could lead to enhanced tactile feedback for prosthetic hands.

<u>More information:</u> "The Role of Fingerprints in the Coding of Tactile Information Probed with a Biomimetic Sensor." J. Scheibert, S. Leurent, A. Prevost, and G. Debregeas (13 March 2009) Science 323 (5920), 1503. <u>DOI: 10.1126/science.1166467</u>

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