

## Prosthetic Hand Brings Back Tactile Sense

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Source: LifeHand 2 / Patrizia Tocci

Nine years after he had lost his left hand in an accident with fireworks, Dennis Aabo Sørensen regained his sense of touch thanks to a sensory-enhanced prosthetic hand. An international team of scientists and surgeons from various European countries developed the device and connected it to nerves in his upper arm.

The technology measures the tension in artificial tendons that control his finger movement and sends an electrical signal to a computer. An algorithm translates the signal into an impulse that can be understood by the nervous system.

With his previous commercial prosthetic allowing him to open and close his hand, Sørensen relied on his eyes to handle it. Since he didn't receive a feedback to his nervous system, he was always at risk to damage the subject he was holding. A research group at Freiburg University had developed the thin, ultra-precise electrodes that allowed relaying faint electrical signals directly into the nervous system.

"This is the first time in neuroprosthetics that sensory feedback has been restored and used by an amputee in real-time to control an artificial limb," says Silvestro Micera, the project leader from the Ecole polytechnique fédérale de Lausanne (Switzerland).

The researchers tested the new system in various experiments. Blindfolded Sørensen was able to detect shape and consistency of different objects he picked up with his hand. "When I held an object, I could feel if it was soft or hard, round or square," he is quoted in a press release. "The sensory feedback was incredible. I could feel things that I hadn't been able to feel in over nine years."

According to the university, it will take years to develop the device into a commercial product. The research team aims to miniaturize the electronic system so it can be completely implanted. The study was published in the current issue of Science Translational Medicine

-- By [Thomas Klein](#), Managing Editor, EMDT

[thomas.klein@ubm.com](mailto:thomas.klein@ubm.com)