

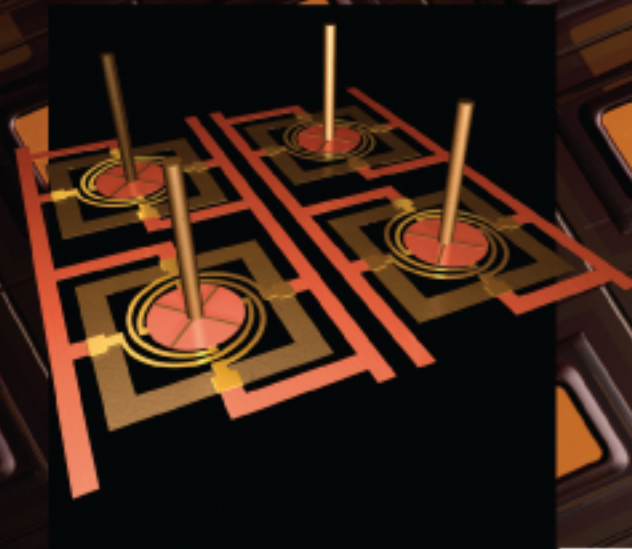
SENSORS:

Inspired by Nature

Novel materials research and powerful pattern recognition algorithms are enabling researchers to design, build, and employ sensors that mimic highly complex biological processes, such as the sensory perception of higher mammals.

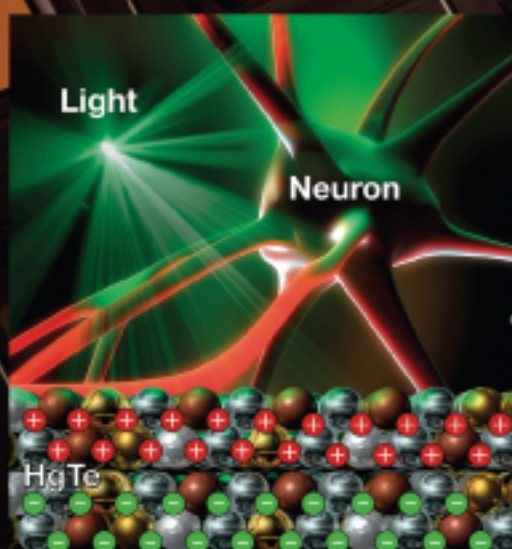
Touch

At the University of Illinois at Urbana-Champaign, Chang Liu and his colleagues are using MEMS techniques to produce micro-scale sensor arrays that combine the sensitivity, robustness, and flexibility of hair cells, an important sensory component of human skin.



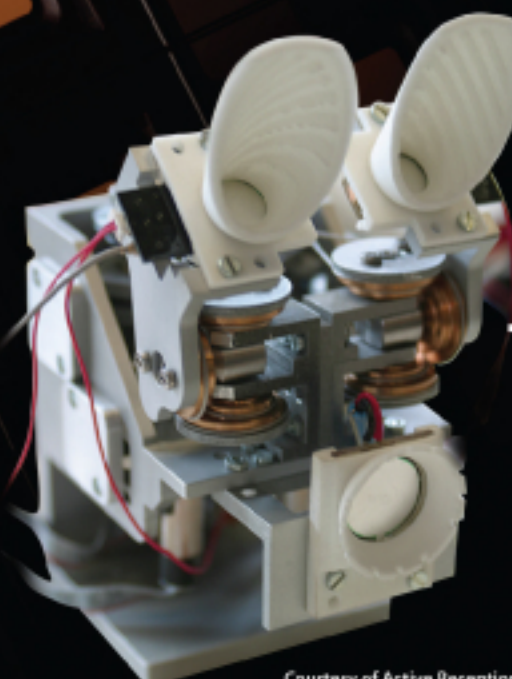
Sight

Researchers at The University of Texas and the University of Michigan, led by Nicholas Kotov, have electrically linked nerve cells with photovoltaic nanoparticle films, a breakthrough that could lead to the development of a number of photoreceptive nerve signaling devices, including a nanoparticle based artificial retina.



Sound

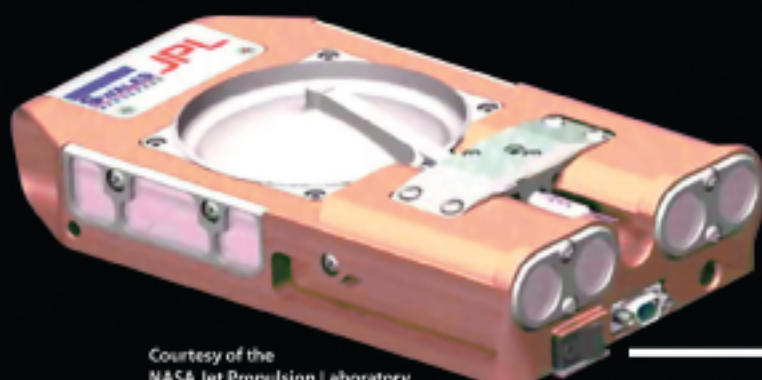
The Bat-Bot, developed by Dr. Herbert Peremans and colleagues at the Active Perception Lab, University of Antwerp, is the first robotic system to mimic the echolocation used by bats to orient themselves and locate prey. Biomimetic echolocation could be used as a navigational aid for robots and for people who are sight impaired.



Courtesy of Active Reception Lab/University of Antwerp.

Smell

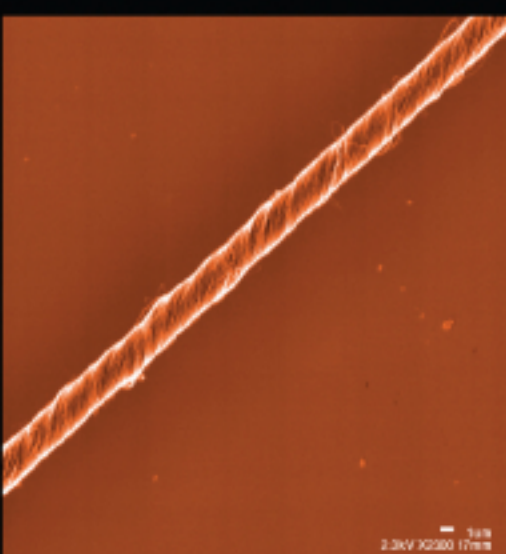
Scientists at the Jet Propulsion Lab have developed an array of sensors that mimics the action of the mammalian nose by recognizing patterns of response to vapors. The system is designed to allow for low-cost environmental monitoring and quality control in food processing, industrial monitoring, and chemical and biological threat detection.



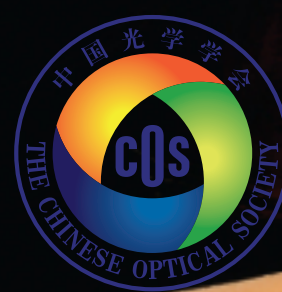
Courtesy of the NASA Jet Propulsion Laboratory.

Taste

Nano-sized carbon tubes coated with strands of DNA are being used by researchers at the University of Pennsylvania and Monell Chemical Sciences Center as tiny sensors arrays with the ability to "taste" very faint traces of compounds in solution, suggesting applications ranging from domestic security to biotechnology.



Courtesy of Los Alamos National Lab.



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