



Connected Matter: Wireless Network of Computing Particles for Electronic Skin Devices

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Grand Challenge and Goal:

Realization of flexible and robust electronic skin devices based on the Connected Matter architecture, which integrates tiny computing particles through wireless power transfer and communication

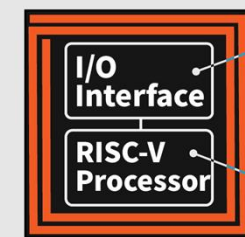
Summary:

- We propose Connected Matter, an architecture which wirelessly interconnects and powers tiny computers equipped with sensing, processing, and communication capabilities
- This approach enables electronic skin devices that simultaneously achieve three properties: flexibility with robustness, support for diverse form factors, and ease of sensor integration
- The system is composed of computing particles, a high-density wireless power and communication network, and highly stretchable, extensible antennas. We establish the design methodology for this system and develop it into an open platform

Social Impact:

- Robust sensors for applications such as AI robots, as well as for medical wearables and smart textiles
- By engaging players across diverse fields, including AI, HCI, robotics, we accelerate the societal deployment of diverse sensing devices

Computing particle



Wireless power/data
SoC + Antenna

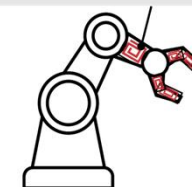
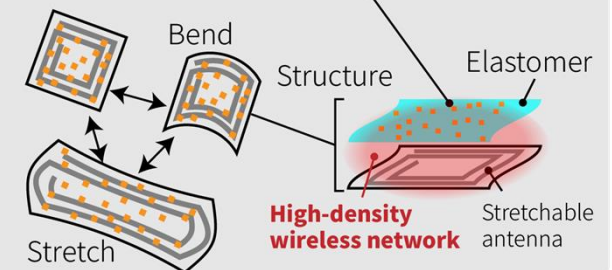
- Sensor
- LED

Interface for
third-party
customization

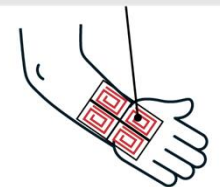
- Network ctrl.
- Data processing

Abstract power &
data operations

Connected Matter



Robotic skin



Wearable sensor