Ubiquitous Imperceptible Electronics Laboratory

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Research interests include…

Wireless signal/power transfer, especially using 2-D media (e.g., conductive textile)

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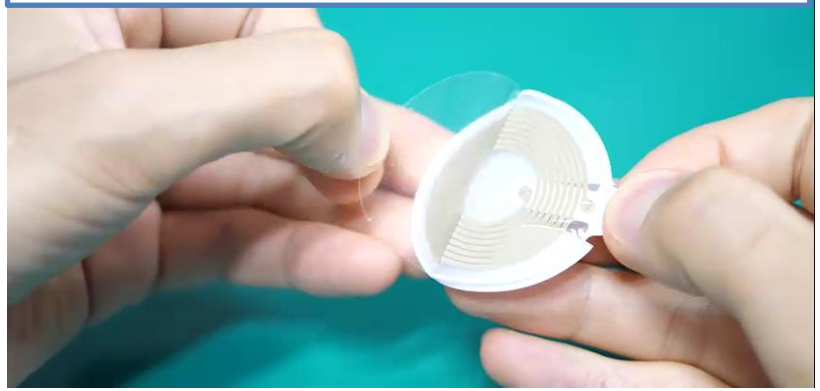
2-D wireless signal/power transfer

Flexible NFC sensor patch



Wearable signal/power transfer

Large-area 2-D communication of textile

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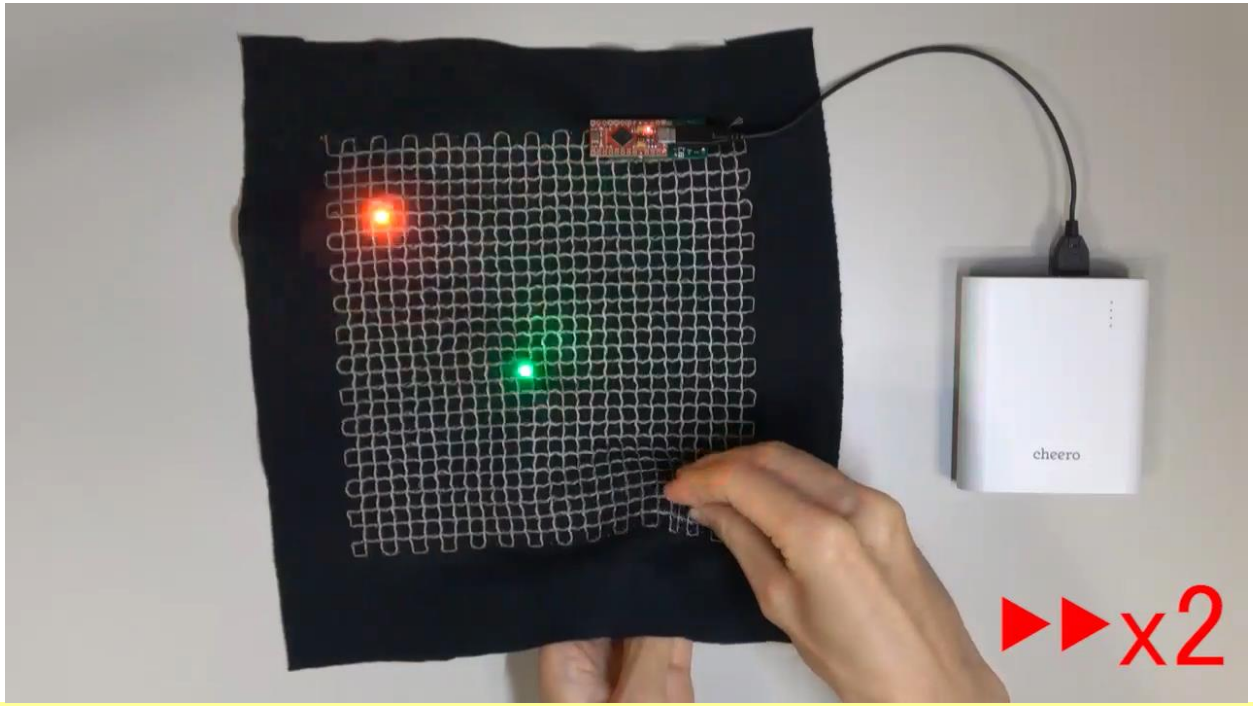
SSP Research Projects

Signal/power transfer, sensing and display systems on 2-D media

- Wearable multi-sensor systems
  using textile-based 2-D communication
- Wearable tactile display
  applying textile-based 2-D communication
- Wireless power transfer
  via PT-symmetric resonant system including 2-D waveguide

Primitive implementation of textile-based communication

N-bit parallel transmission using *N* carriers on a single transmission line



A. Noda and H. Shinoda: **"Frequency-Division-Multiplexed Signal and Power Transfer for Wearable Devices Networked via Conductive Embroideries on a Cloth"**, *Proc. IEEE IMS 2017*.

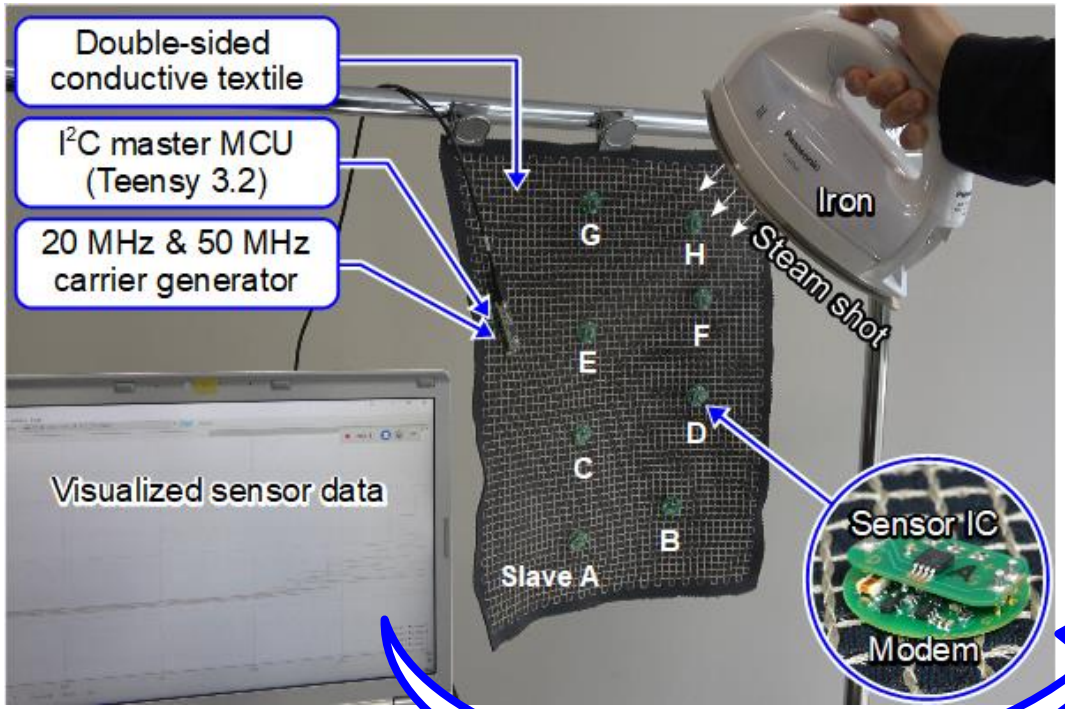
Towards wearable systems

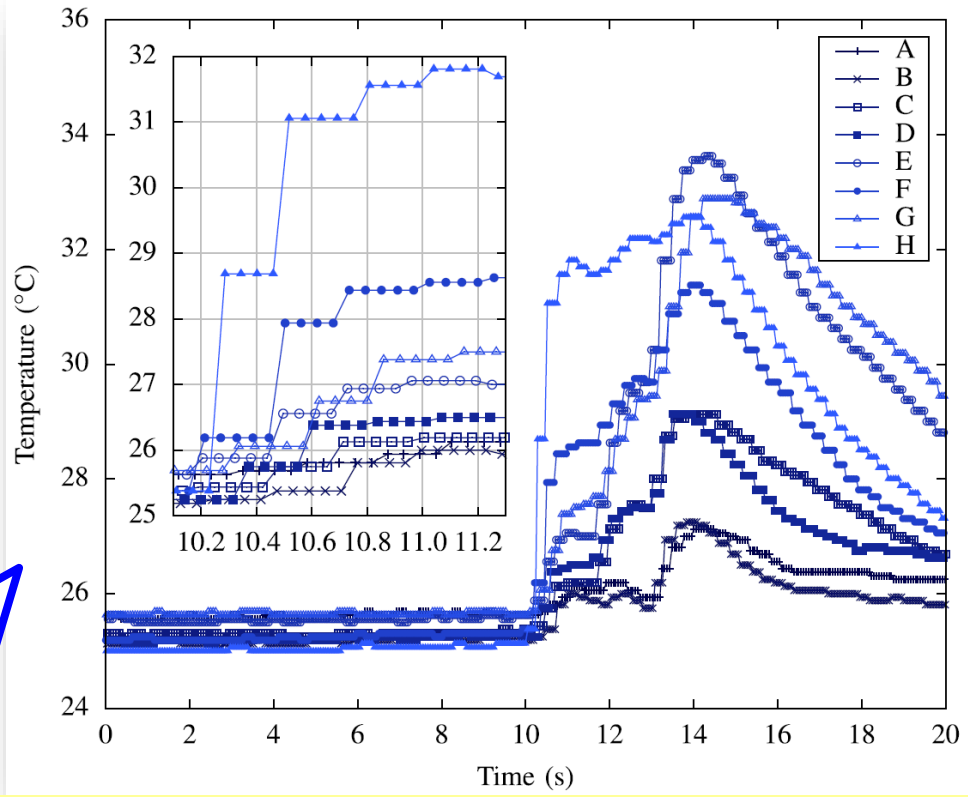
Communication via clothing made of conductive textile

A. Noda and H. Shinoda, "Simplex Inter-IC for Wearables and Its Applications," in *IEEE Access*, vol. 9, pp. 69654-69662, 2021, doi: 10.1109/ACCESS.2021.3078133.

Distributed sensor system

Batteryless/antennaless sensor modules on textile

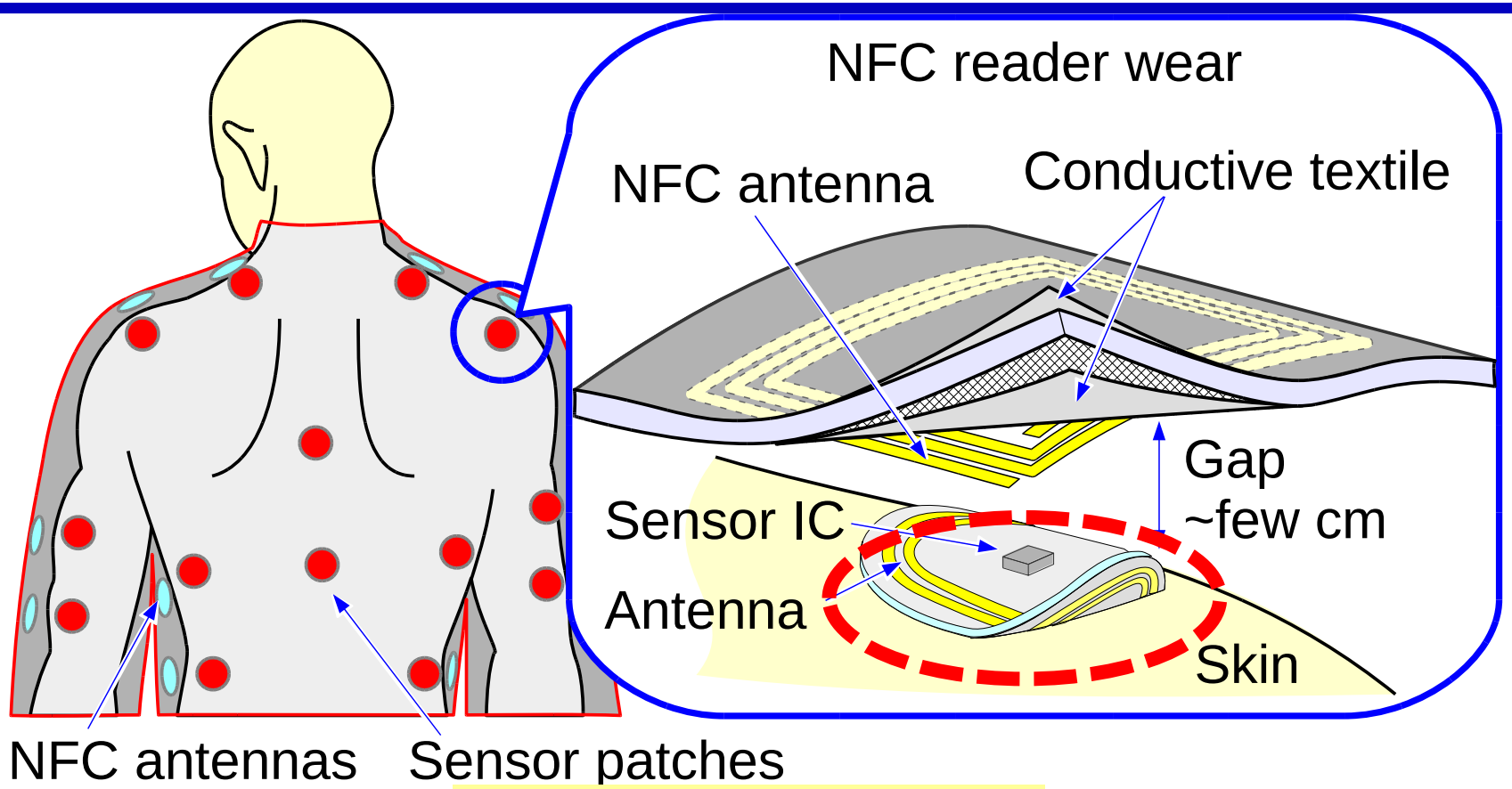




A. Noda and H. Shinoda, “Inter-IC for Wearables (I2We): Power and Data Transfer Over Double-Sided Conductive Textile," in *IEEE Transactions on Biomedical Circuits and Systems*, vol. 13, no. 1, pp. 80-90, Feb. 2019, doi: 10.1109/TBCAS.2018.2881219.

NFC (near field communication) sensor patch

Wearable NFC reader system (many antenna applied on clothing)



A. Noda, patent no. 6653819