2025 IEEE World Haptics Conference (WHC)
Suwon Convention Center, Suwon, Korea
July 8 ~ 11, 2025

Modular, Multi-Layer e-Skin For Robotics: Real time visualisation

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***Abstract*—Effective tactile sensing for robotics demands robust sensors capturing diverse tactile signals such as pressure, vibrations, and shear forces. Traditional sensors often rely on complex mechanical structures or intricate electronics, which can be costly and challenging to manufacture. To address these challenges, we present our bioinspired electronic skin (e-skin), which is featured in our accepted paper at WHC 2025. The e-skin employs a modular and multi-layered design integrating arrays of force-sensitive resistors (FSRs) and accelerometers within compliant silicone layers. This structure allows precise capture of slow-varying normal and shear forces, as well as high-frequency vibrations. During the demonstration, participants will interact directly with the e-skin, observing real-time data visualisation and deformation mapping of tactile inputs. They will experience first-hand how the e-skin uses multi-modality and multi-nodality to reliably differentiate between texture, shape, and stiffness variations.**

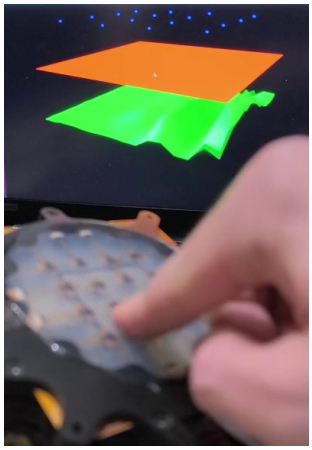

Fig. 2. Graphical user interface. The participants will be able to interact directly with the skin and have a real time visual representation of the deformation

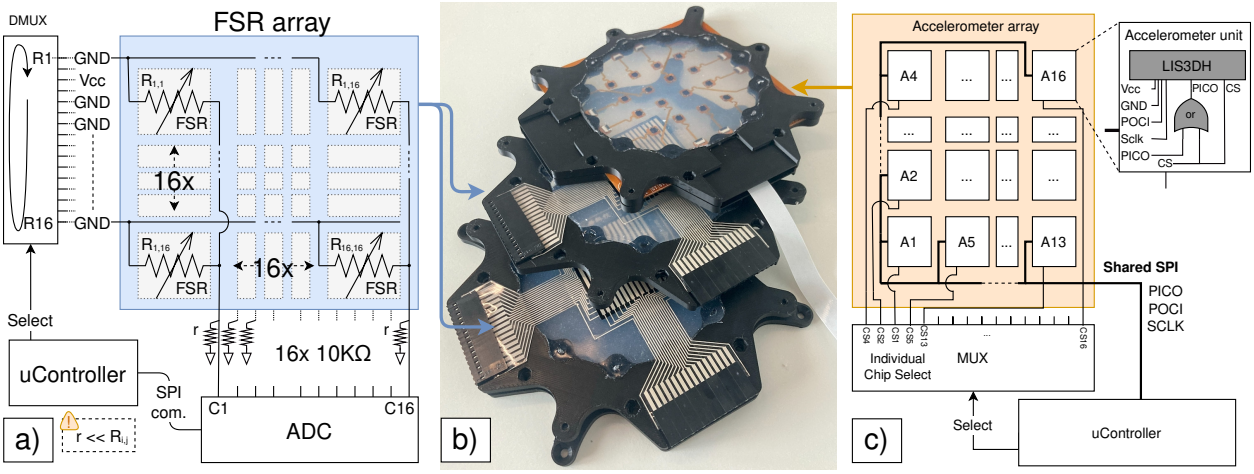

Fig. 1. **Our implementation of modular e-skin with the sensory layers and components displayed in (b). The FSR array electronic diagram is shown in (a), and the accelerometer array electronic diagram in (c).**

This work was supported by the EC H2020 grants INTUITIVE (ITN 861166) and PH-CODING (FETOPEN 829186).