ReSkin: versatile, replaceable, lasting tactile skins

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Introduction

dexterous manipulation

We believe a significant bottleneck in dexterous manipulation is the lack of practical solutions to tactile sensing.

Quality

- conformal contact
- accurate compression and shear force measurements
- high force (<0.1 N) and temporal resolution (>100 Hz)
- large surface area coverage (>4 cm2)

For practical reasons:

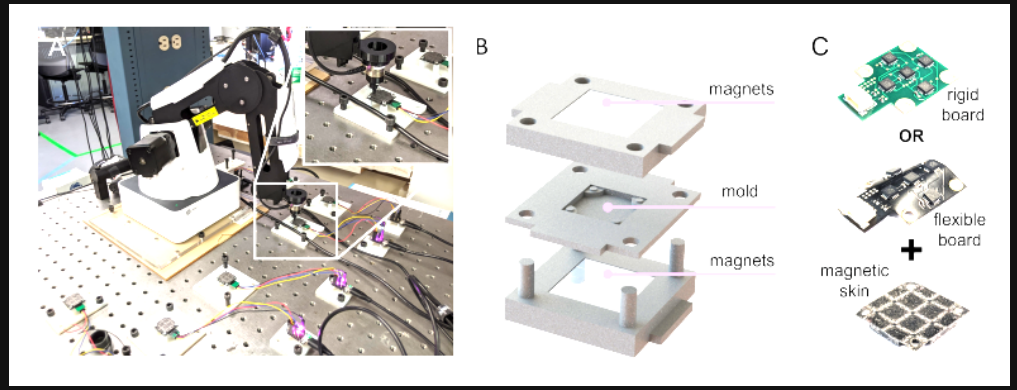
- compact and versatile
- inexpensive
- long-lasting

Other Work

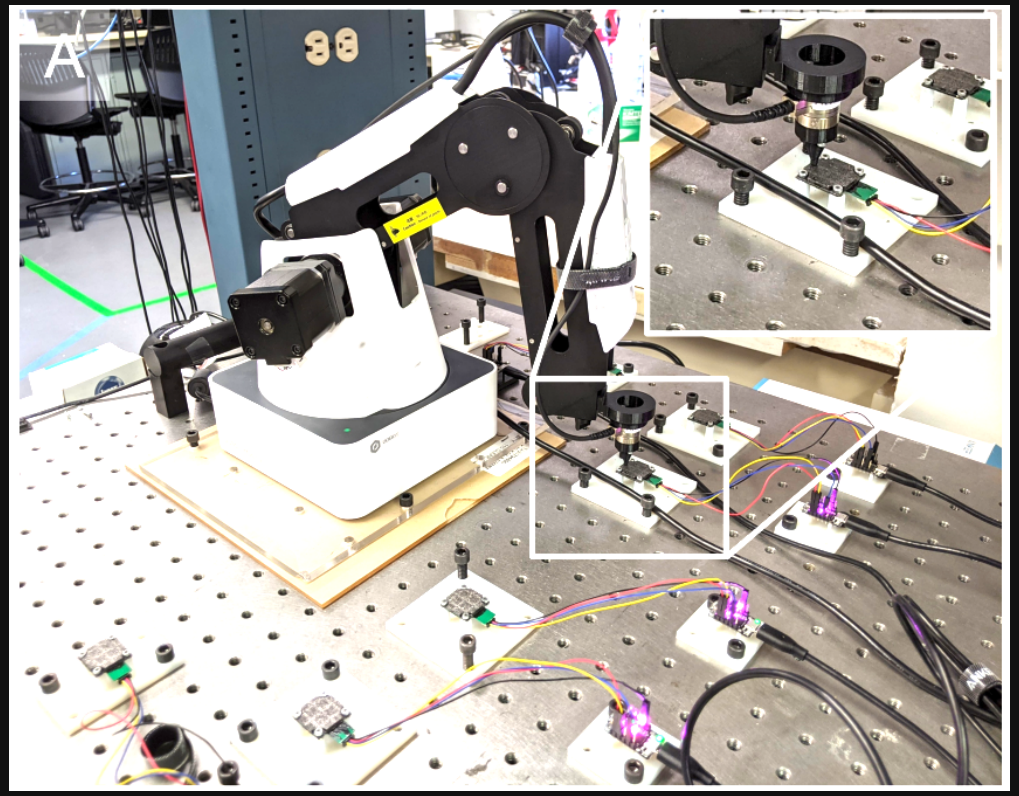
- CV
- Resistive/Capacitive
- Rigid

Design and Fabrication

fabrication video



Experimental Setup



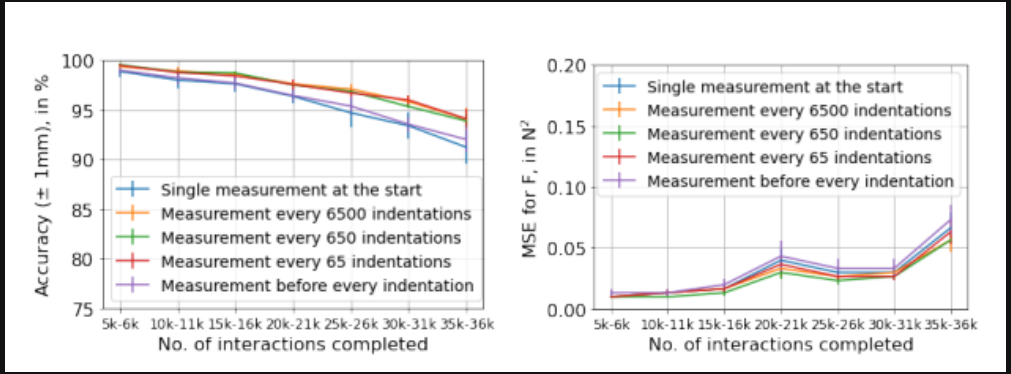
Single Model

Goal: magnetic flux B$\rightarrow x, y, |F|$

Model:

$$B(15) \rightarrow MLP + ReLU(200) \rightarrow MLP(200) \rightarrow MLP(40)$$

$$\rightarrow MLP + ReLU(200) \rightarrow MLP + ReLU(200) \rightarrow xyF(3).$$



Multi Sensor and Self-supervised Learning

- multiple sensors training
- triplet loss

$$L_{triplet} = max(0, \|feat(B_a) - feat(B_p)\|^2 - \|feat(B_a) - feat(B_p)\|^2)$$