

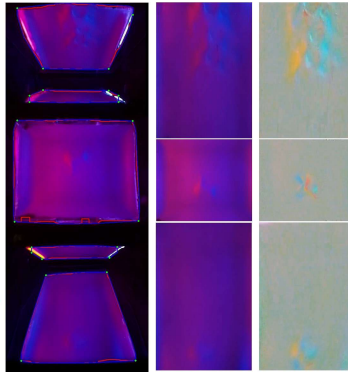
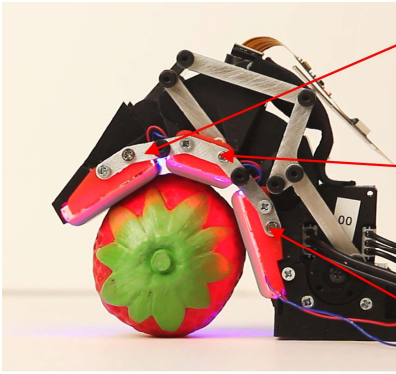


# GeLink: A Compact Multi-phalanx Finger with Vision-based Tactile Sensing and Proprioception

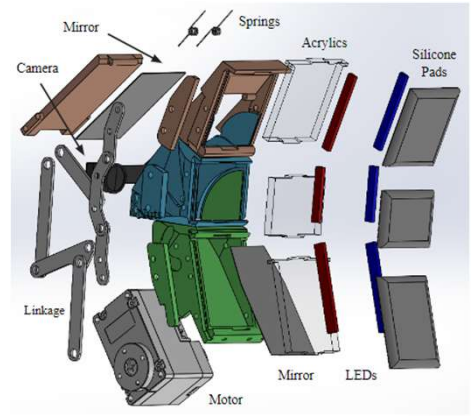
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## Overview



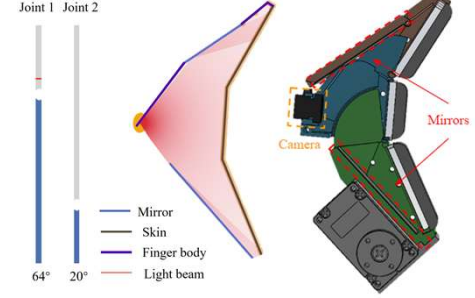
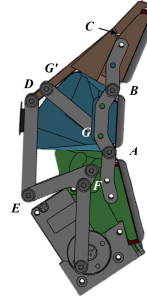
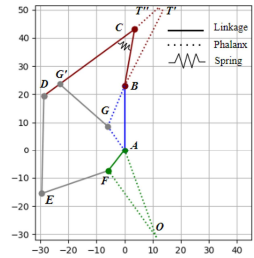
GeLink is a robotic finger incorporated with high-resolution tactile sensing, with three phalanges and two DOFs, controlled by only one motor and sensorized by only one camera.



## Hardware Design

We develop a planar linkage mechanism simulator and a planar reflection simulator to simplify the tactile sensing hardware.

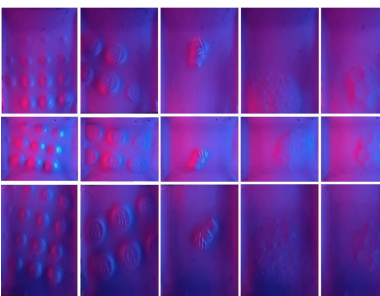
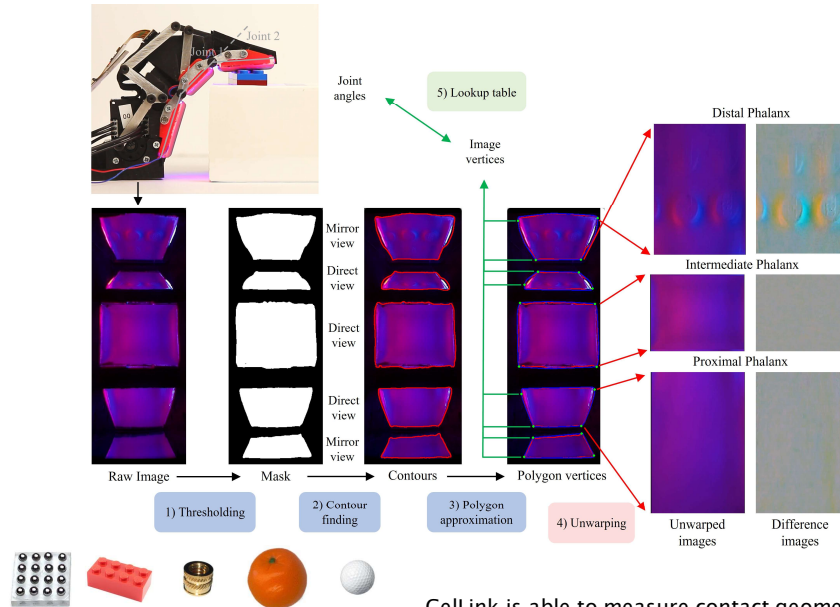
The main design goal is to reduce the amount of hardware needed and still maintain the functionality and versatility of a multi-phalanx finger with embedded tactile sensing.



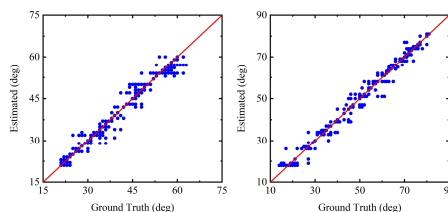
Linkage Simulator

Tactile Sensing Design

## Tactile sensing and proprioception



GeLink is able to measure contact geometry and its joint angles using one single camera. Contact imprints and joint angles can be extracted from raw images.



## Grasping Task

Object	Joint 1 (deg)	Joint 2 (deg)
Yellow Cup	76.0°	73.4°
Yellow Cup	31.3°	25.2°
Orange	35.4°	38.1°
Orange	37.9°	31.2°
Orange	24.8°	30.5°
Orange	47.0°	34.2°