Soft Pressure Sensors for Controlling a Force Amplifying Glove for Assisting the Elderly

Compliant grippers allow for dexterous manipulation without difficult sensory feedback and hardware control. These machines, and all of soft robotics, has been enabled by materials chemistry and not computer or electrical engineering. Recently, the Shepherd lab has developed a manufacturing method for soft actuators: rotational casting. This manufacturing method creates monolithic and seamless pneumatic actuators that apply large forces, we have applied this technique to force amplifying gloves. In order for the wearer to tell the glove what to do, we need to integrate force sensors into the finger tips of the gloves. The Shepherd lab has also developed stretchable capacitive sensors that feel like skin—the interested student will apply these sensors to the gloves for force feedback control of the force augmenting gloves. The student will be teamed with material scientists and electrical engineers to realize the feedback controlled glove for assisting those with reduced musculature (e.g., the elderly and stroke patients).