

ORTHOTIC HAND

People with debilitating disorders resulting in loss of upper extremity function are in need of orthotic devices to supplement muscle strength to allow for activities of daily living. In this context, an actuator is an ideal option to be used for an orthotic hand. It is desirable that the actuators be light, cheap, cosmetic, relatively fast, be capable of a force of 12 N per finger, and actuate enough to bend the joints of a hand. Our research group recently demonstrated that silver coated nylon yarn (figure 1) to be an effective, relatively inexpensive actuator which is electrothermally driven [1]—an optimal solution for this purpose. This project will be designed to engineer a working prototype of a cost-effective and efficient orthotic hand to help patients that do not have anymore a functional hand. Mechanical, electrical and/or programming skills will be a plus for this interdisciplinary project. Bench hand models (figure 2) will be used to test the orthotic hand. The case for the actuators will be done by 3D printing and for the controlling part the reKam1 technology from TI (figure 3) would be used.

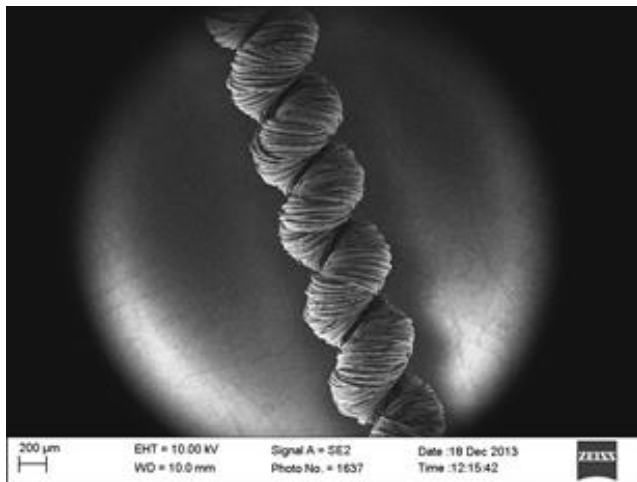


Figure 1: silver coated nylon actuator that will be used.



Figure 2: One of our bench hand models.



Figure 3: reKam1 from TI.

References:

- [1] C.Hanes et al, Science 21 (2014) pp. 868-872.