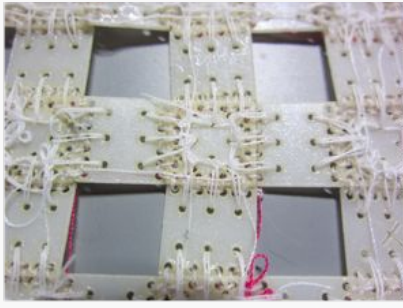


Rapid Robotic Prototyping with Machine Embroidery

Cindy K. Harnett - University of Louisville



**Thursday,
April 5th 2018, 1pm
Location CSE 1202**

Fibers are available with a vast assortment of material properties that cannot yet be matched by low-cost 3D printing, laser cutting or machining, but these additive and subtractive manufacturing methods are the basis for rapid robotics prototyping. When fibers are needed in a design, they are often installed by hand. This seminar discusses methods my group has developed to use consumer-grade embroidery equipment for automated aligned fiber installation in robotics applications including sensing and actuation. Functional fiber sheets are installed not only in 3D printed and laser cut parts, but in flexible sheets, breathable materials and stretchable silicones using methods borrowed from sewing. We have also adapted these methods to work with thick fibers that consumer equipment can not handle, expanding the materials set to include tendons and elastomeric stretch sensors.



Dr. Cindy K. Harnett is an associate professor of Electrical and Computer Engineering (ECE) at the University of Louisville. Her research interests focus on compliant structures, microfabrication, and low-power sensor networks. She received her Ph.D. from Cornell University in Applied and Engineering Physics, B.S. in physics from Harvey Mudd College, and worked at Sandia National Laboratories (California) before joining the ECE faculty.

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Hosted by Mike Tolley

The **Contextual Robotics Institute** aligns world-class expertise in hardware, software, cognitive science, design, machine learning, materials, security, and more, in order to develop systems that sense the environment around them; learn from experience and situational awareness; and act autonomously to assist humans and serve the public good.