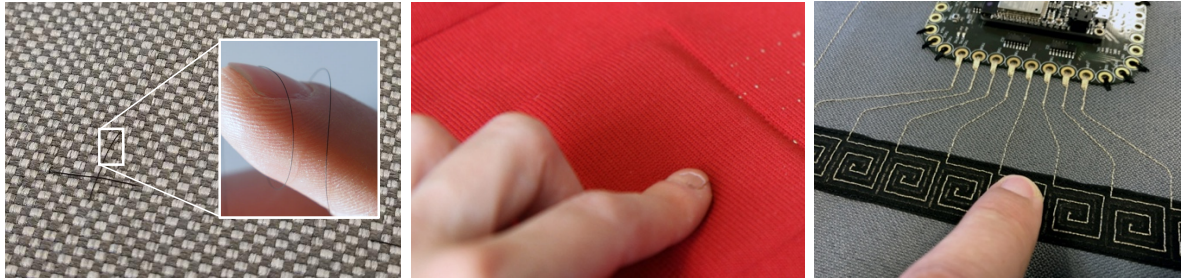# Imperceptible Textile Interfaces

Michael Haller, Media Interaction Lab - AUSTRIA
haller@fh-hagenberg.at

Abstract

In the last fifteen years, we have witnessed a dramatic trans formation of our society through the miniaturization of computing technologies. This introduced a new age in which people can access the power of computing devices on-demand, just by reaching into their pockets. While such electronics can be helpful in numerous situations, these technologies alone have limited reach and impact. With "Imperceptible Textile Interfaces", our vision is to embed intelligence into the ubiquitous medium of textiles, thereby ushering in a new era in which everyday objects and even the very clothes we wear can play an unobtrusive yet always-accessible and powerful role in enhancing our experience of all aspects of our lives ranging from transportation and communication to work and play. In this talk, we will present a novel sensing approach enabling a new kind of yarn-based, resistive pressure sensing.

Bio

Michael Haller is a professor at the department of Interactive Media of the University of Applied Sciences Upper Austria (Hagenberg, Austria), where he is founder and director of the Media Interaction Lab (www.mi-lab.org), responsible for computer graphics & human-computer interaction. His core areas of expertise are smart graphics and the development of next-generation user interfaces. He received Dipl.-Ing. (1997), Dr. techn. (2001), and Habilitation (2007) degrees from Johannes Kepler University of Linz, Austria. His current focus is on innovative interaction techniques and smart interfaces for next generation working environments. Currently, he leads a team of over 10 researchers and students. He has been awarded the Erwin Schrödinger Fellowship Award, Google Research Award, Europrix Top Talent Award, Best ACM SIGGRAPH Emerging Technologies Award, and Microsoft Imagine Cup. Six of his papers were awarded best paper or honorable mention at top HCI venues including ACM CHI and ACM UIST.

Suggested readings

Ou, Jifei & Oran, Daniel & Haddad, Don D. & Paradiso, Joseph & Ishii, Hiroshi. (2019). SensorKnit: Architecting Textile Sensors with Machine Knitting. 3D Printing and Additive Manufacturing.

Ivan Poupyrev, Nan-Wei Gong, Shiho Fukuhara, Mustafa Emre Karagozler, Carsten Schwesig, and Karen E. Robinson. 2016. Project Jacquard: Interactive Digital Textiles at Scale. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16). ACM, New York, NY, USA, 4216-4227.

Alex Olwal, Jon Moeller, Greg Priest-Dorman, Thad Starner, and Ben Carroll. 2018. I/O Braid: Scalable Touch-Sensitive Lighted Cords Using Spiraling, Repeating Sensing Textiles and Fiber Optics. In Proceedings of the 31st Annual ACM Symposium on User Interface Software and Technology (UIST '18). ACM, New York, NY, USA, 485-497.

Patrick Parzer, Florian Perteneder, Kathrin Probst, Christian Rendl, Joanne Leong, Sarah Schuetz, Anita Vogl, Reinhard Schwoediauer, Martin Kaltenbrunner, Siegfried Bauer, and Michael Haller. 2018. RESi: A Highly Flexible, Pressure-Sensitive, Imperceptible Textile Interface Based on Resistive Yarns. In Proceedings of the 31st Annual ACM Symposium on User Interface Software and Technology (UIST '18). ACM, New York, NY, USA, 745-756.