UNIVERSITY OF MINNESOTA

Minnesota Robotics Institute

ROB 8970 **ROBOTICS COLLOQUIUM** **FALL 2025**

Class Report – Lecture 9 (10/31/2025)

Speaker : Dr. Brad Holschuh

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Dr. Brad Holschuh delivered an engaging lecture on *Soft Robotics Using Shape Memory Materials for Wearable Technology Applications*. He discussed how wearable robotics combines human centered design, apparel engineering, and robotics to create intelligent and responsive garments. With the help from his background in aerospace, Dr. Holschuh told how these innovations aim to improve human body movements, comfort, and safety. The talk focused on the vision of garments that can adjust their size according to fitting, provide assistance, or respond to environmental changes. He shared examples of wearable technologies being developed for space exploration, healthcare, and daily life. The lecture focused on the interdisciplinary collaboration between design and engineering. Overall, it showcased how wearable robotics can transform how humans interact with context to technology in both professional and everyday lives.

Questions

- How do you see fashion designers and robotic engineers working together in the future to make wearable robots more mainstream?
- What kind of ethical or privacy issues might show up when clothing itself becomes intelligent or responsive?
- Could wearable robots one day become as common as smartwatches or fitness trackers in our daily lives?

Comments

- The connection between space suit engineering and wearable robotics made the talk very interesting.
- The mix of apparel design and robotic implementation provided a refreshing, interdisciplinary perspective.
- Demonstrations of compression garments and self-tightening textiles clearly showed potential in real world usage.
- The combination of SMA actuation with passive buckles to maintain tension was a beautiful engineering solution.

What I Liked

- The lecture consisted storytelling from aerospace history with detailed soft robotics research.
- Real prototypes such as self-tightening sleeves and haptic feedback jackets made the ideas feel practical.
- Connection of wearable robotics to comfort, safety, and human experience was clearly mentioned and explained.

Areas for Improvement

- A comparison of different smart materials like SMA, SMP, LCE in terms of strength, speed, and efficiency would add more clarity and interest.

Overall Assessment

This lecture provided an interesting overview of how soft robotics can revolutionize wearable systems. Dr. Holschuh showed how shape memory materials can be used in adaptive clothing and medical wearables that can give functionality with comfort. His integration of engineering design, human factors, and textiles highlighted the importance of interdisciplinary collaboration. The talk was both futuristic and deeply practical, demonstrating how robotics can become part of everyday life through wearable technology.