UNIVERSITY OF MINNESOTA
Minnesota Robotics Institute

Class Report – Lecture 3 (09/19/2025)
Speaker : Prof Stephen Guy

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In this lecture Prof. Guy talked and gave us insights on Visual Behaviour Modelling using image processed data to learn about human behaviours and then using those models for robotics, healthcare and interaction. Firstly, he talks about the shift from traditional model based approaches to modern data driven-approaches. Then he moves on to talk about a custom reaching game which was used to study bilateral arm coordination, where motion data from hundreds of participants showed patterns across age and helped neural networks to predict age from movement of writs of participants. Then he talked about **Egocentric Vision**, demonstrating how a first person video and large data sets like meta's Ego4D can be used to help Ai to predict what action comes next and what is the location of that action in 3D space. Moreover, he discussed the connection of this egocentric vision to robot navigation, discussing how human inspired statistical models, social rules and reinforcement learning can make robot movement more natural and smoother. Towards the end of the lecture, he discussed about some future aspects with LLMs helping robots understand and interact with real world and other environments more intelligently.

Questions

- Do you think methods like reinforcement learning for navigation are realistic for robots with limited compute, like mobile medical robots or assistive devices?
- From a robotics student perspective, where would you suggest we start if we want to apply motion data modeling to small-scale robots or simulations?

Comments

- The use of egocentric video for predicting where to perform the next action represents a significant step rather than simply identifying objects in images.
- The ability to estimate participant's age from their wrist motion patterns demonstrates how very simple movements can carry very deep information.
- The transition from model based approaches to data driven approach shows how there is a shift in robotics and AI towards real-world experimentation.
- The use of discomfort based human-like collision avoidance is a very uselful alternative to rigid mathematical motions in robot navigation.

What I Liked

- I liked seeing the connection between studies on human behaviour and robotics, since it relates to my own interests in computer vision and human-robot interaction.

Overall Assessment

The lecture discussed how studying human movement with cameras can help both doctors and robots. I learned that small details, like how people smile or reach for objects, can reveal a lot about behavior and even help design better medical tools and smarter robots. Overall, it made me realize that by learning from natural human actions, technology can become more useful and human-like.