ROBOTICS SEMINAR
FRIDAY, March 26, 2021
12:00-1:00 p.m.

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Towards an Intelligence Architecture for Human-Robot Teaming

Abstract: Advances in autonomy are enabling intelligent robotic systems to enter human-centric environments like factories, homes and workplaces. To be effective as a teammate, we expect robots to accomplish more than performing simplistic repetitive tasks; they must perceive, reason, perform semantic tasks in a human-like way. A robot's ability to act intelligently is fundamentally tied to its understanding of the world around it. In this talk, I will present recent work on constructing an intelligence architecture centered around a semantic world model that can be acquired from observation and interaction. First, I will address the problem of grounding natural language instructions in the context of the robot's world model by leveraging visual-linguistic context accrued over time. Next, I will discuss how a robot can take introspective actions to infer the latent or "missing" aspects of its world model. Finally, I will share emerging work in learning common sense knowledge about the when symbolic actions are relevant for a task from human demonstrations; aiding plan synthesis for human-intended goals.

Brief Bio: Rohan Paul is an Assistant Professor and Pankaj Gupta Young Faculty Fellow at the Department of Computer Science and Engineering, Indian Institute of Technology Delhi, India. His research program is aimed towards capable service robots that can perform complex tasks along-side humans. Previously, he served as a Postdoctoral Associate at the Computer Science and AI Laboratory (CSAIL) at the MIT working with Prof. Nicholas Roy contributing towards programs funded by the RCTA, the Toyota Research Institute and the National Science Foundation. Rohan obtained a D.Phil. at the Oxford University advised by Prof. Paul Newman. Rohan obtained his B. Tech. and M.Tech. degrees at the Indian Institute of Technology (IIT) Delhi. He has published at ICRA, RSS, IJRR, AAAI, IJCAI, IROS, winning Best Paper Awards at RSS 2016 and IROS 2013, was named Finalist for Best Vision Paper Award at ICRA 2010 and was awarded the Bracken Bequest Research Prize at Oxford. He is a recipient of two National Awards from the Govt. of India and was named one of "35 Global Innovators Under 35" by MIT Technology Review in 2016. His work has been featured in MIT News, Engadget, Wall Street Journal, BBC, Wired, TEDx, Times of India.

Host: Ji Zhang

To meet with the speaker contact: Stephanie Matvey (smatvey@andrew.cmu.edu)