

University of Rochester
Department of Electrical and Computer Engineering Colloquia Series

**An adaptive human-robot collaboration approach through perception-based
real-time adjustments of robot behavior in industry**

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Wednesday, December 6th
12:00PM – 1:00PM
Computer Studies Building 523

Abstract:

With the current market trend resulting in short product lifespan and increasing demand, the complexity in automation using robots has also increased. This has increased the need for having human robot collaboration. The biggest concerns of human robot collaboration are human safety, human compliance and human trust in automation. Collaborative robots, with build in protective stops have been introduced that reduce the risk of injury in the event of human robot collision. However, the underlying idea of suspending robot motion to avoid human injury is still the convention, as there is no inherent robot intelligence. This affects the overall productivity negatively. To address these challenges and concerns, I will present a novel framework for a system that will supervise the robot's action and behavior in the human-robot shared workspace. The function of the robot supervision system is to adaptively control the robot motion based on the human actions in order to optimize the productivity of a task while ensuring human safety and develop human trust in automation. The real-time perception of the human action and environment will be done using a motion capture setup. I will explain the inspiration for the framework that was based on a Skill, Rule and Knowledge based human behavior model. The aspects of human robot interaction in an industrial setup will also be presented. I will show some preliminary results and simulation setups that have been done in the lab. An evaluation criterion of the proposed system in terms of safety, performance

