Interactive Multi-Agent Dynamics Simulation for Physical and Virtual Worlds

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Abstract: Collective behavior is all around us, from crowd rallies, ant and robot swarms, to avatars in virtual reality. Understanding such behavior is critical when preparing for emergency situations, increasing the fidelity of virtual worlds, conceptualizing urban layouts, and improving human-robot cooperation. In this talk, I will present our approach for learning, modeling and simulating multi-agent dynamics.

First, I will demonstrate a physics-based optimization approach for multi-agent simulation, which is an alternative to traditional velocity-obstacle approaches in robotics. Our method simulates large masses in interactive rates for hundreds of thousands of agents, which was previously unachievable. This work received the best paper award in the ACM SIGGRAPH conference on Motion in Games 2017. Second, I will discuss our recent results on Deep Reinforcement Learning for multi-agent navigation, which allows fine-grain rewards-based strategies for controlling agent locomotion behaviors. We will illustrate how our techniques can be applied to the simulation of human-like crowds, with applications to computer animation, gaming, pedestrian dynamics, visual surveillance and robotics.

Friday, October 21, 11:00 - 12:00pm

In-Person! BUSN 106 or Remote: https://tinyurl.com/bdewak4u