

## Assembly, Parts Feeding, and Nonprehensile Manipulation

Prof. Kevin Lynch

Northwestern University

(hosted by Prof. Ken Goldberg, IEOR and EECS)

### Abstract

Traditional robot assembly is a centralized top-down process, where one or more robot arms place parts into a growing assembly. On the other hand, self-assembly is a decentralized bottom-up process, where parts are designed to bond with each other so that the desired assembly is an attractor. In both cases, the "assembly program" is somehow encoded in the dynamics of the system.

Between these two regimes lie most industrial parts feeding systems. Parts feeder design typically involves the choice of fixtures, vibratory motions, and even properties of the parts to shape the system dynamics to induce the desired "assembly." One goal of our work is to automate the design and control of parts feeders. In this talk I will describe our progress using nonprehensile manipulation modes such as batting, sliding, and rolling for parts feeding and handling.

### Biographical Sketch

Kevin Lynch received his Ph.D. in Robotics from Carnegie Mellon in 1996. He is currently a Charles Deering McCormick Professor of Teaching Excellence in the Mechanical Engineering Department at Northwestern University, where he is director of the Mechatronics Design Lab and co-director of the Laboratory for Intelligent Mechanical Systems. He is a co-author of "Robot Motion Planning" (MIT Press 2005) and Senior Editor of the IEEE Transactions on Robotics. He has received the IEEE Early Academic Career Award in Robotics and Automation and Northwestern's Engineering Teacher of the Year award. His research interests include robot motion planning and control, robotic manipulation and assembly, human-robot interaction, and self-organizing systems.

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