Putting the Turing into Manufacturing:
Recent Developments in Algorithmic Automation

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Time     :  11:00 a.m. – 12:00 noon
Venue   :  Room 215, William M. W. Mong Engineering Building, CUHK

Abstract
Automation for manufacturing today is where computer technology was in the early 1960's, a patchwork of ad-hoc solutions lacking a rigorous scientific methodology. CAD provides detailed models of part geometry. What's missing is formal models of part behavior, frameworks for the systematic design of automated systems that can feed, assemble, and inspect parts.

"Algorithmic Automation" introduces abstractions that allow the functionality of automation to be designed independent of the underlying implementation and can provide the foundation for formal specification and analysis, algorithmic design, and consistency checking. Algorithmic Automation can facilitate integrity, reliability, interoperability, and maintainability and upgrading of automation.

Researchers are developing a variety of algorithmic models. I'll present results from my lab and others on specific problems in part feeding and fixturing, including a framework for fixturing deformable parts and new geometric primitives for vibratory bowl feeders, and propose open problems for Computational Geometers.

Biography
Prof. Goldberg is craigslist Distinguished Professor of New Media at UC Berkeley. He teaches, makes art installations, and supervises research in Robotics, Automation, and New Media. His artwork and research explore contemporary issues in technology. Ken holds dual degrees in Electrical Engineering and Economics from the University of Pennsylvania (1984) and a PhD from Carnegie Mellon University (1990). He joined the UC Berkeley faculty in 1995 and is Professor of Industrial Engineering and Operations Research, with secondary appointments in EECS and the School of Information. Ken has published over 150 peer-reviewed technical papers on algorithms for robotics, automation, and social information filtering, and he holds eight U.S. patents. He is Editor-in-Chief of the IEEE Transactions on Automation Science and Engineering (T-ASE), Co-Founder of the Berkeley Center for New Media, Co-Founder and CTO of Hybrid Wisdom Labs, Co-Founder of the Moxie Institute, and Founding Director of UC Berkeley's Art, Technology, and Culture Lecture Series. Ken's art installations, based on his research, have been exhibited internationally at venues such as the Whitney Biennial, the Berkeley Art Museum, the SF Contemporary Jewish Museum, the Pompidou Center, the Buenos Aires Biennial, and the ICC in Tokyo. Ken has co-written three award-winning Sundance documentary films, "The Tribe", "Yelp", and "Connected: An Autoblogography of Love, Death, and Technology." He is represented by the Catharine Clark Gallery in San Francisco. Ken was awarded the Presidential Faculty Fellowship by President Clinton in 1995, the National Science Foundation Faculty Fellowship in 1994, the Joseph Engelberger Robotics Award in 2000, and was elected IEEE Fellow in 2005.

*****  ALL ARE WELCOME  ****