Digital Fabrication: Designing with Physics in Mind

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Abstract:

In computer graphics, many of the 3D objects we model are physically-inspired or are designed with the intent of being built or manufactured. Yet the tools developed for geometric modeling are often unaware of structural considerations. In this talk I will discuss novel algorithms that use principles of mechanics and stability to enhance traditional modeling pipelines, with a specific focus on 3D printed objects. I will present systems that enable artists to create surprisingly balanced designs, or modify an object's moment of inertia to create spinning toys. On a larger scale I will present an architectural application for physics-based design, that enables assembling stone structures with minimal material. This research has been presented at SIGGRAPH, and featured in numerous media sources including MIT Technology Review and Make magazine.

In addition to my own research, I will talk about ongoing work at Dartmouth College in the Department of Computer Science, and open the floor to any questions about our PhD program.

About the Speaker:

Emily Whiting is a professor of Computer Science at Dartmouth College. She works in Computer Graphics, where her research interests span architectural geometry, computer-aided design, and 3D fabrication. Previously she was a Postdoctoral Fellow at ETH Zurich. She received her PhD (2012) from MIT in Computer Graphics and Building Technology. She obtained her MSc (2006) in Computational Design from the MIT Department of Architecture, and BSc (2004) in Engineering Science from the University of Toronto. Her background also includes stints in R&D at Lucasfilm’s Industrial Light & Magic, structural design with Halcrow Yolles engineering firm, and cultural heritage with the National Research Council of Canada.

All are welcome!
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Room 328
Chow Yei Ching Building
The University of Hong Kong