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MECHANICAL ENGINEERING COLLOQUIUM SERIES 2014-2015

Mechanical Engineering Lecture in Design

Visual Thinking and Ideation Through 3D Design Abstraction

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Today's design environments take advantage of powerful computational technology more than ever before. However, as design software becomes increasingly more sophisticated, it also becomes more difficult to master, requiring an increased demand for human specialization and expertise. In the Visual Design and Engineering Lab at Carnegie Mellon, we are developing human-centric 3D modeling techniques to assist shape creation in the early stages of the design process. Our fundamental strategy is to enable a level of design abstraction to appropriately support visual thinking and computational ideation activities.

In this talk, I will highlight our research in this area with an emphasis on natural user interfaces for shape creation and manipulation. In the first half the talk, I will present a new modeling software for rapidly designing and detailing 3D shapes. In the second half, I will describe a data-driven shape analysis and synthesis technique that can geometrically abstract existing shapes, and use the results to decipher tacit design rules underlying man-made shapes. Based on this technique, I will demonstrate our recent work in co-constrained shape manipulation and brand-identity recognition. Finally, I will describe our present work in semantically driven CAD technology, where shape manipulation is controlled solely by perceptual attributes rather than conventional geometric handles.

Refreshments will be served before the seminar.
Please contact Tony Pulsone at pulsone@mit.edu with any questions.

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