Computer Science
Seminar

Expressive computation: integrating programming and physical making

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Abstract: Abstract: Creators in many different fields use their hands. Artists and craftspeople manipulate physical materials, manufacturers manually controlmachine tools, and designers sketch ideas. Computers are increasingly displacing many manual practices in favor of procedural description and automated production. Despite this trend, computational and manual forms of creation are not mutually exclusive. In this talk, I argue that by developing methods to integrate computational and physical making, we can dramatically expand the expressive potential of computers and broaden participation in computational production. To support this argument, I will present research across three categories: 1) Integrating physical and manual creation with computer programming through domain-specific programming environments. 2) Broadening professional computational making through computational fabrication technologies. 3) Broadening entry points into computer science learning by blending programming with art, craft, and design. Collectively, my research demonstrates how developing computational workflows, representations, and interfaces for manual and physical making can enable manual creators to leverage existing knowledge and skills. Furthermore, I'll discuss how collaborating with practitioners from art, craft, and manufacturing science can diversify approaches to knowledge production in systems engineering and open new research opportunities in computer science.¡br¿ ¡BR¿
Bio: Jennifer Jacobs is Assistant Professor at the University of California Santa Barbara in Media Arts and Technology and Computer Science (by courtesy). At UCSB, she directs the Expressive Computation Lab, which investigates ways to support expressive computer-aided design, art, craft, and manufacturing by developing new computational tools, abstractions, and systems that integrate emerging forms of computational creation and digital fabrication with traditional materials, manual control, and non-linear design practices. Prior to joining UCSB, Jennifer received her Ph.D. from the Massachusetts Institute of Technology and was a Postdoctoral Fellow at the Brown Institute of Media Innovation within the Department of Computer Science at Stanford University. She also received an M.F.A. and B.F.A from Hunter College and the University of Oregon respectively. Her research has been presented at leading human-computer interaction research venues and journals including UIST, DIS, SIGGRAPH, and, most prominently, at the flagship ACM Conference on Human Factors in Computing Systems (CHI). ¡br¿
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