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Computational Thinking Meets Design Thinking: Technology and Arts Collaborations

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There seems to be an explosion of interest in exploring arts and technology connections: new media, digital media, kinetic art, new frontiers, emergent media, interdisciplinary, multidisciplinary, and transdisciplinary are only some of the terms used to describe this fusion of disciplines. A visit to the ACM SIGGRAPH Art Gallery or the ACM SIGCHI Interactivity sessions, for example, will showcase a wide variety of uses of computing, embedded control, sensors, and actuators in the service of art. This emerging arena for collaboration brings up a number of questions. Are fine arts and technology compatible partners? Do these disciplines support each other or flinch when they are combined like oil and water? Do collaborative efforts provide interesting insights and opportunities for students? For practitioners?

In this talk I will start with some thoughts on the nature of combining arts and technology, and show some historical and contemporary examples specifically relating to kinetic art. Kinetic art using embedded control is a marriage of art and technology. Artistic sensibility and creativity are required for concept and planning, and computer science and engineering skills are required to realize the artistic vision. However, these different skills are often taught in extremely different parts of a university campus. To this end, I will also describe an ongoing collaborative course that involves Computer Science and Art students working together to design and create computer-controlled kinetic art. Students in the course explore interfacing of embedded computer systems with sensors and actuators of all sorts. They also explore physical and conceptual aspects of machine-making as a fine-art sculpture process. Our goal is to enhance the educational experience of both groups of students. We believe that both student groups gain significant and unusual benefits that they can apply in a variety of ways in their respective disciplines.

Biography: Erik Brunvand is an Associate Professor of Computer Science in the School of Computing at the University of Utah. His research interests are related generally to computer design and implementation. His research group is currently working on designing special-purpose computers for generating very realistic computer graphic images using a technique called ray tracing. His interests in computer design and engineering extend from the integration of software and hardware at a high level, to the detailed design of the processor, to its VLSI implementation. He has also done significant research in the area of asynchronous system and circuit design including a framework for syntax-directed design of asynchronous systems, and full processor designs using asynchronous techniques. He has published close to 100 articles and technical reports in areas ranging from computer design and VLSI, to arts/technology collaborations, and computer science education.

He is also fascinated with arts/technology collaborations. Starting in 2009 he has co-developed and taught a collaborative course entitled Embedded Systems and Kinetic Art. This course involves computer science and art students working in teams to design and build collaborative computer-controlled kinetic artworks. He has also recently developed a new general-education course entitled

Making Noise: Sound Art and Digital Media. This course introduces students from all parts of campus to technology and electronics through noise-making projects such as circuit bending (modifying an existing music-making or speaking toy to become a sound-art noise generator). This interest in arts/tech collaborations has led Prof. Brunvand to explore a variety of kinetic mixed media art pieces, many involving electronic control, and including sculptures that make their own drawings. He has shown his artwork in a wide variety of venues, including the ACM SIGGRAPH Art Gallery in 2014.