

## Supple[Core]: Interaction Design as a Design Tool

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### ABSTRACT/PURPOSE

The use of computer and computational design is shifting and changing the design culture and design process radically. The rapid development of such approaches in architecture raises the concern that the full richness of human experience and evaluation may no longer be present in certain aspects of design, and that a gap may arise between the architect's direct awareness of human needs and the ultimate, computationally-assisted design outcomes. (Kalantari, Poustinchi, 2017). In the context of an undergraduate design studio, the Supple[Core] project presents a mixed-method design- research investigation that integrates a Hybrid Digital – Physical design platform for developing a design language and designing an interior space using interaction design as a design tool.

### METHOD:

Increasingly larger amounts of creative resources are being put into producing new tools and concepts that are designed not to make things but, to amplify the creative capacities of others (Lavin, 2015). The Supple[Core] research studio is based on the idea of previous research investigations where the design of the space is the result of human-based studies. Typically, these methods are highly relying on statistic data and analysis from either or both pre and post-occupancy evaluations. The Supple[Core] method, however, is studying how human-based design--through the lens of interaction can affect the design language or the design process.

Throughout the studio, students introduced to design computational techniques, visual programming, and interaction-design thinking, as scholarly design-research tools. Then, employing interaction and physical computational design techniques, students study the conceptual and theoretical supports of their design in an abstract field of force simulating design relationships between an object (massing core), landscape (ground condition), and an interactive "surface".

### PROCESS:

Students started with a literature review of existing "interactive" architectural components such as doors, windows, and sliding walls and looked their design and interactive characteristics such as volumetric, tectonic, surface and vector qualities and conditions. As the second phase, they developed and used an interactive design scenario between an Object, Landscape and a surface, to study the potentials of animated components in regards to developing spatial configuration. Students used advanced digital fabrication techniques such as CNC milling, plaster casting using the CNC milled molds, 3D printing, and laser-cutting, to fabricate physical models of their conceptual studies on Object, Landscape, and the surface. Activating/animating the physical models, using Arduino Microcontroller, servo motors, and linear actuators, they have been able to develop a "mechanical machine" to study visual statements and dialogues between "core" and architectural elements in the space: Massing, ground condition, and interiors surfaces.

In the next and the final step, using the object/landscape/surface machine, each student translated these studies into a design language that informs their design for a social media creative studio space, using the design potential and possibilities explored in the interactive digital and physical computational design process.

The most significant outcome of the Supple[Core] studio, is to introduce and use interaction design--through digital design, fabrication and physical computation, as a new form of a design tool for architectural design. This studio encouraged students as junior researchers to question their digital and analog design tools, through a hybridized digital/physical platform of an interactive design process.

# SUPPLE[CORE]: INTERACTION DESIGN, AS A DESIGN TOOL

EBRAHIM POUSTINCHI (Kent State University, United States, mpoustin@kent.edu)

## ABSTRACT

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The use of computer and computational design is shifting and changing the design culture and design process radically. The rapid development of such approaches in architecture raises the concern that the full richness of human experience and evaluation may no longer be present in certain aspects of design, and that a gap may arise between the architect's direct awareness of human needs and the ultimate, computationally-assisted design outcomes. (Kalandari, Poustinchi, 2017). In the context of an undergraduate design studio, the Supple[Core] project presents a mixed-method design-research investigation that integrates a Hybrid Digital – Physical design platform for developing a design language and designing an interior space using interaction design as a design tool.

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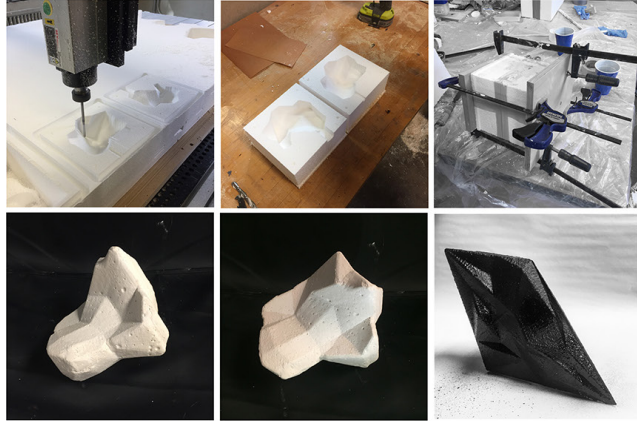
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## REFERENCES

Kalandari, S., Poustinchi, E. (2017), Human-Computer Interaction in the form-making process, Proceedings of the 22nd International Conference of the Association for Computer-Aided Architectural Design Research in Asia (CAADRIA) 2017, 529-539.  
Lavin, Sylvia. (2015, July 13). "Man vs. Machine: Sylvia Lavin Retools Creativity." Los Angeles Forum for Architecture and Urban Design. Retrieved from <http://laforum.org/delirious/man-vs-machine-sylvia-lavin-retools-creativity/>

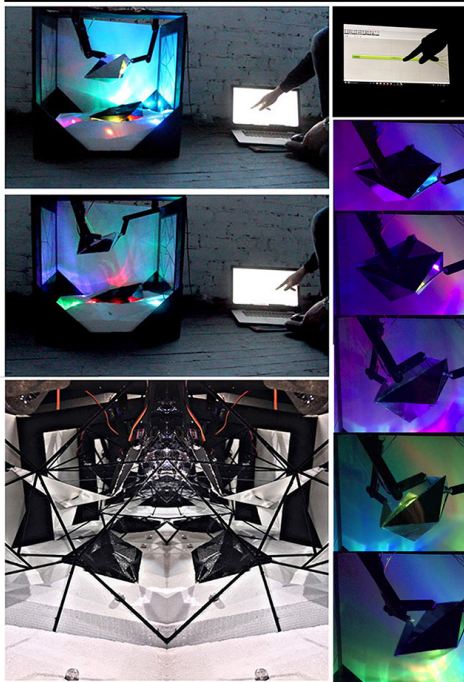
## A. OBJECT



## B. LANDSCAPE + INTERACTIVE SURFACE



## C. INTERACTION DESIGN AS A DESIGN TOOL



## D. DESIGN | CREATIVE STUDIO/OFFICE SPACE | PLAYA VISTA CAMPUS, CA

