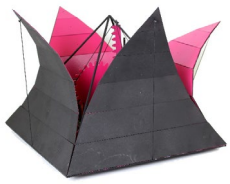
Instructor: Rachel Dickey
Office: Storrs 147
T/R 5:30 to 6:45pm
Email: rdickey4@uncc.edu



PREMISE

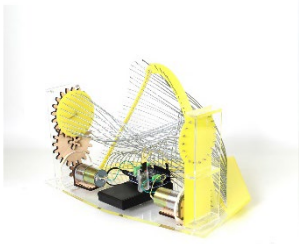
From algorithmic design to open source and from virtual reality to robotics, many designers are seeking new tools to explore formal and functional properties as sources of ordering systems. This is an introductory course which focuses on computational techniques in architecture as they specifically relate to design processes and procedures. The topics of the course will borrow concepts from computer science, computational geometry and other fields and adapt them to specific design problems such as design development, fabrication, robotics, material simulation, and environmental analysis. A specific area of interest for the course will investigate

OBJECTIVE

The objective of the course is to help students become better informed users of digital tools and develop the skills necessary for creating or manipulating computational solutions for specific design problems, which include geometry generation and manipulation, interaction design, and design evaluation. As part of the course, students will acquire some hands on experience in parametric modeling, programming, and physical computing as these are essential crafts, which underpin computational design.

METHOD

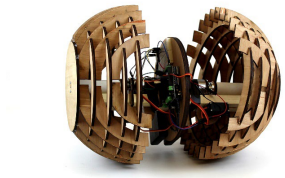
The format for the class will follow a Tuesday / Thursday schedule with an additional meeting day for individual sections. Tuesday lectures examine the history and theory of machine epistemology in architecture and draw from a variety of precedents ranging from early 19th century to the present. These examples demonstrate how design actualization and innovation relies on available tools and knowledge of techniques. The lectures will frame larger topics within a historical context while also providing time for further instruction on complex topics. Thursdays workshop sessions introduce the basics to computational thinking through hands on experience and teaching of various tools and techniques. These sessions are guided workshops, which introduce topics related to the homework assignments. These assignments provide students with the opportunity to learn and practice new tools and techniques.



The mid-term project asks students to analyze variation, patterns and then develop a design, and parametric model for a small pavilion (10x10x10) based on that analysis which has at least 300 unique parts and a clear fabrication strategy for structure and skin. The final project invites students to collaboratively demonstrate their knowledge from the semester in topics of computational thinking, parametric modeling, digital fabrication, and physical computing by designing and fabricating a small robot.

PREREQUISITES

ARCH_6101/6102 or M2 standing for graduates.
A basic knowledge of computers and experience with 3D modeling, particularly Rhinoceros, is highly-recommended. No prior programming experience is expected or required.



COURSE MATERIALS

Students are required to purchase the list of required materials provided on canvas.
These supplies include an Arduino and related electronics necessary for the physical computing portion of the class and are essential for completion of final projects.

COURSE SOFTWARE

All required software is available on SoA lab computers. However, students are additionally required to have the software installed on their personal laptops in order to execute their coursework. Rhinoceros (Rhino) is required for the course. Grasshopper (grasshopper3d.com) is a free plugin for Rhinoceros that you will also need. Plug-ins for grasshopper will also include the use of Paneling Tools and Kuka Prc Plugin, which aids in the production of machine code for operation of the school's industrial robot. Arduino Software (IDE) is software that makes it easy to write code and upload it the micro controller and can be found online for free.