ARCH 497-03 | ARCHITECTURAL ROBOTICS | SUMMER 2016 | T 9a-3p | CR-001 | BRETT BALOGH

Say the word robot, and you will conjure images from popular culture where mechanical creatures perform feats of inhuman strength, intelligence, speed and even malevolence. Aside from media representations, robots are useful tools we have created to perform work for us. Robots release us from the burden of menial, repetitive or dangerous work, increase the efficiency of work through their speed and accuracy and even care for, heal or house us. For any task that we might want to do, a robot can be designed or at least imagined to perform that task.

Robots, as extensions of ourselves, pose interesting problems regarding how we relate to ourselves and the world around us. What happens when we amplify our ourselves? If we as humans relate to architecture in human ways, how might amplified versions of ourselves do so? In this course, we will examine how a robot can activate space and interact with architecture. We will look at robots as prostheses that augment the built environment, adding human elements of whimsy, personality, behavior, mobility, conflict, agency and freedom through technological proxies to otherwise static structures or empty spaces. Robots will become critical agents in the subversion of traditional expectations of space and the built environment.

Students will research and develop a robotic system over the course of the semester that augments the built environment and will present the final project along with associated research and media to be evaluated for their final grade. Students will be introduced to all aspects of robotic systems, including programming, electronics, mechanics and fabrication. Students will also read and discuss the history and theory of robotics and how it relates to the architectural discipline. Students will be personally responsible for purchasing an electronics kit (not to exceed $100) as well as other necessary materials to complete projects.

GOALS

- Research current and historical trends in architectural robotics
- Develop competency in CAD using Rhinoceros 3D and Grasshopper
- Effectively design with intent to fabricate
- Develop skills in the proper use of digital fabrication tools
- Integrate various elements to create systems
- Engage architectural form and space in time
- Build on the work of others and share in kind

POLICIES

-Each student will research a topic developed in conjunction with the instructor. The research will serve as supporting material for a physical project. The project and associated research will be presented as a project proposal at midterm and as a finished physical prototype and research paper for the final. All work will be released under a creative commons license. See https://creativecommons.org/

-Each student will maintain a research blog using github and jekyll. Students are required to make blog posts at least once a week. The research blog should contain information pertinent to the research and to the development of the physical prototype. Blog posts will contain writing, images and time-based media highlighting the process of project development.

-Assignments will be given to enforce skill building. The format of the assignments will vary and may consist of readings, software projects and/or physical objects. It is the student's responsibility to complete assignments outside of class time and to present them on the day they are due. Students should also expect to purchase their own construction materials and tools to complete assignments.

-The BSMP Academic Training agreement states that students will work 30hrs/week. Although studio meetings are only six hours per week, you are expected to spend another 24 hours per week working on research or the

-Students are expected to attend every class, but are permitted one unexcused absence. Those missing class are responsible for making up work in a timely manner. In the case of extended illness or other extenuating circumstances, the student should contact the instructor as soon as possible and provide a written excuse. Excessive unexcused absences will not be tolerated. More than one absence will result in the reduction of the final grade by one letter. The final grade will be reduced by one letter for each unexcused absence thereafter.

-The criteria for grading are promptness, accuracy, innovation, creativity and craftsmanship. Late assignments without a reasonable explanation are automatically reduced by one letter grade for each week it is overdue. All course work must be documented on the student's research blog and any associated media uploaded to the student's github repository in order to receive full credit. The final grade will be determined by the following percentages:

10% Assignments | 40% Midterm | 50% Final

-Kits and Materials: Students will be required to purchase an electronics kit costing no more than $100. Kit components will be purchased from Adafruit (http://www.adafruit.com). The kit wish list is located at this URL: **http://www.adafruit.com/wishlists/403729**. Additional items and materials from other vendors may need to be purchased in order to complete projects.

-AMERICANS WITH DISABILITIES (ADA): Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must go through the Center for Disability Resources office. The Center for Disability Resources (CDR) is located in Life Sciences Room 218, telephone 312 567.5744 or disabilities@iit.edu.

STUDIO CULTURE

This Summer research opportunity is intended to be a rigorous exploration of architectural robotics through research and making. The student will have to manage all aspects of the research project, including reading, writing, learning new skills in electronics, coding and digital fabrication as well as maintaining a repository of all research media and providing proof of progress via a research blog. Students should see the studio as a collective endeavor. Given the wide range of skills and knowledge required, collaboration is encouraged. All students should see themselves as an integral part of the studio experience. Sharing with and assisting others is a must and will aid the studio's success as a whole. Despite the rigor required, emphasis is placed on exploration, experimentation and most of all, fun. The studio will built on the work of others, so students should embrace openness and share their work in kind.

ARCH497-03 Summer 2016
|
+---Week 01 | Studio Environment and Communications
|
+---Week 01 | Research Initiative Workshop
|
+---Week 02 | Programming Intensive Workshop
|
+---Week 02 | Research Consultation
|
+---Week 03 | Electronics Intensive Workshop
|
+---Week 03 | Research Consultation
|
+---Week 04 | Fabrication Intensive Workshop
|
+---Week 04 | MIDTERM CRITIQUE
|
+---Week 05 | Adv Programming Workshop
|
+---Week 05 | Studio Work
|
+---Week 06 | Adv Electronics Workshop
|
+---Week 06 | Studio Work
|
+---Week 07 | Adv Fabrication Workshop
|
+---Week 07 | Studio Work
|
+---Week 08 | FINAL PREP
|
+---Week 08 | FINAL CRITIQUE