Teaching Portfolio

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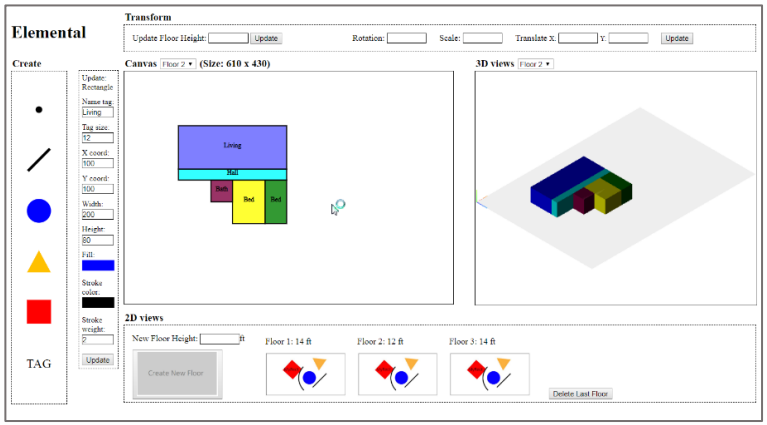
Advanced Design Scripting (ARCH 8833)

Fall 2018

School of Architecture, College of Design, Georgia Institute of Technology

In this course, PhD and MSc students of architecture learned how to develop highly-functional digital tool prototypes for conceptual architectural designs of floor plans. Computational frameworks, tools, and languages taught included Processing, Processing.js, 3.js, P5.js, HTML, CSS, JavaScript, Node.js, C#, and Autodesk Revit.

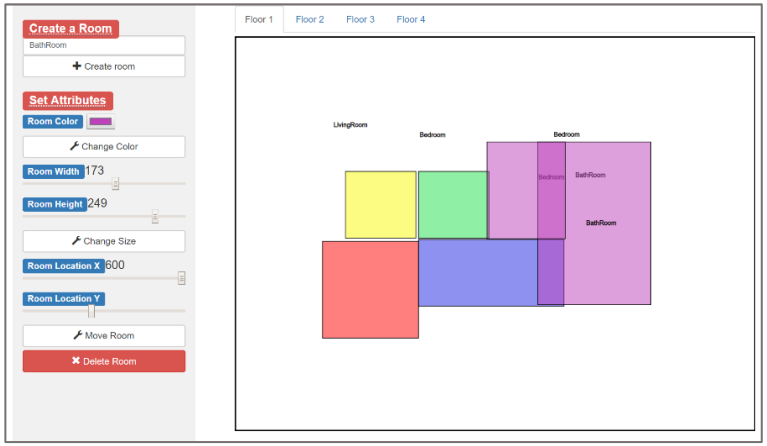
In addition to core programming concepts, students also learned about types of evaluation methods in designing interactive products, how to conduct a simple user study, and how to produce an improved iteration of their prototype tool based on the study feedback.



Graphical user interface (GUI) for a web-based CAD tool with synchronized 2D and 3D views (ARCH 8833, Fall'18)

Learning Outcomes

- Understand the basics of interaction design, including sketching user interfaces, creating GUI transition diagrams, conducting user studies in order to obtain feedback
- Understand core programming concepts, such as control flow, loops (for, while), conditionals (if else), pixel-based images, shape drawing (rectangles, circles, lines, …), simple animations, reading and writing files
- Understand fundamentals of object-oriented programming, of basic Java and Programming constructs, class inheritance
- Understand the architecture of web-based applications, the role of three pillars of web (HTML, CSS, JavaScript), Node.js and NPM for web-enabled applications, and HTML constructs for interactive graphics (svg, canvas, Processing.js, p5.js)
- Able to develop and deploy basic Revit add-ins using Visual Studio and C# programming language



GUI for a web-based CAD prototype featuring a simple property editor and a 2D workspace (ARCH 8833, Fall'18)

Materials in Design (IAT 336)

Eight terms (Fall'11-Spring'17)

School of Interactive Arts and Technology (SIAT), Simon Fraser University (SFU)

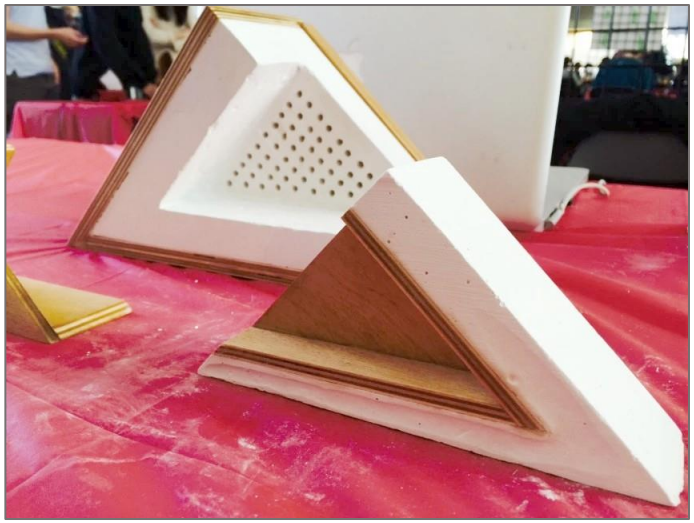
A third-year course with emphasis on materiality in design, product design processes, product affordances and interactions, and design thinking, in different design contexts of mass-produced consumer products.

Typical final project artifacts included a pair of novel tabletop speakers, survival radios, timepieces, and lattice lamps, which were developed using conceptual sketching as well as blue foam, cardboard, and styrene prototyping. Particular emphasis was placed on ways to interact with any of these artifacts, as well as interaction affordances.

A timepiece based on the "infinite mirror", LEDs, Arduino, wood, ABS (IAT 336, Summer 2012)

Learning Outcomes

- Able to explain the selection of appropriate materials in relation to the design process and requirements, considering social and environmental responsibilities
- Describe a range of natural, external forces (e.g. corrosion, physical stresses) and how they impact on material properties
- Distinguish the affordance of materials in relation to human factors as identified in design requirements (e.g. aesthetic, functional, social, ergonomic, and cognitive)
- Demonstrate hand (physical) and rapid (automated) prototyping techniques (e.g. blue foam modeling, styrene, vacuum forming and 3D printing)
- Specify appropriate fabrication techniques; mass production processes (e.g. injection molding, die casting and forging metals) and finishing processes (e.g. surface treatments including painting, sandblasting, plating etc.)



A pair of stereo speakers made using wood, plaster, and electrical wiring (IAT 336, Fall 2014)

Interaction Design Methods (IAT 333)

Summer'16, Summer'17

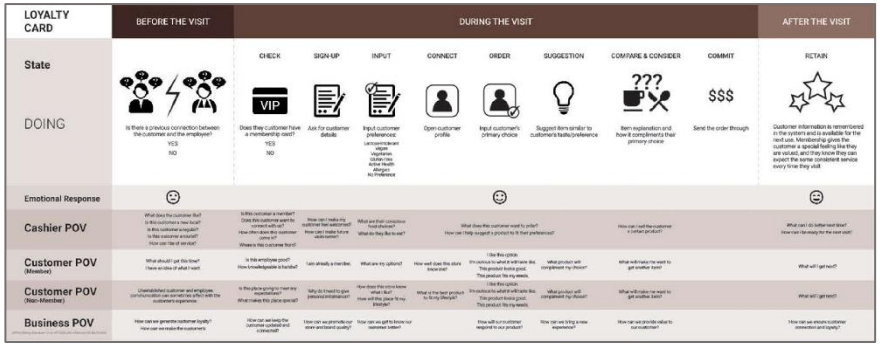
SIAT, SFU

This course examined concepts of design practice and design methods for interaction designers.

Students learned about research methods focused on understanding the people for whom we design, situations of use, participatory involvement and modes of conceptualization. These methods included design ethnography, personas, role-playing, scenarios, participatory workshops and prototyping.

In addition to readings, students engaged in a major interaction design project. Student teams worked with a real-world client throughout the course of the entire semester, which they were expected to locate in the first few weeks of the course. Typical final project artifacts included interactive kiosks, art installations, as well as mobile, web, and Arduino applications.

A conceptual storyboard for a mobile app interaction, intended for connecting members of a theater community (IAT 333, Summer'17)



A user experience map with different points of view (POVs) for various stakeholders using a bakery's "loyalty card" (IAT 333, Summer'16)

Learning Outcomes

- An understanding of interaction design practice in general
- An understanding of a range of user-centered design research methods and techniques, how and when to apply them, and in what contexts
- An ability to synthesize appropriate, custom methods and techniques, as well as apply them through a semester-long project

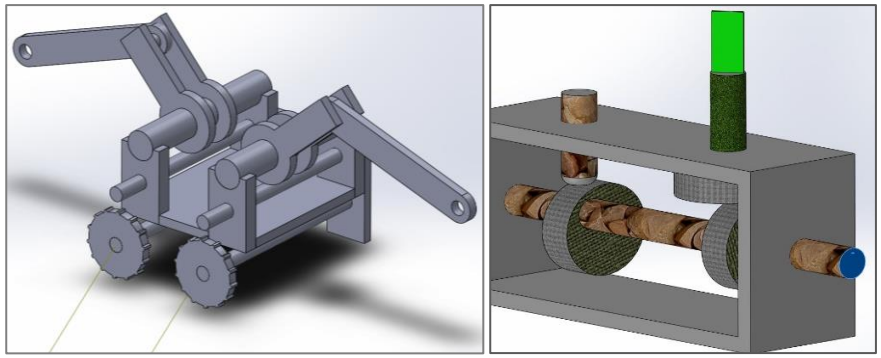
Spatial Thinking and Communicating (IAT 106)

Spring'17

SIAT, SFU

This course introduced the world of 3D thinking, representation and communication, with a focus on spatial thinking. It provided the foundational skills and knowledge needed to understand, create, and use computer-generated 3D representations.

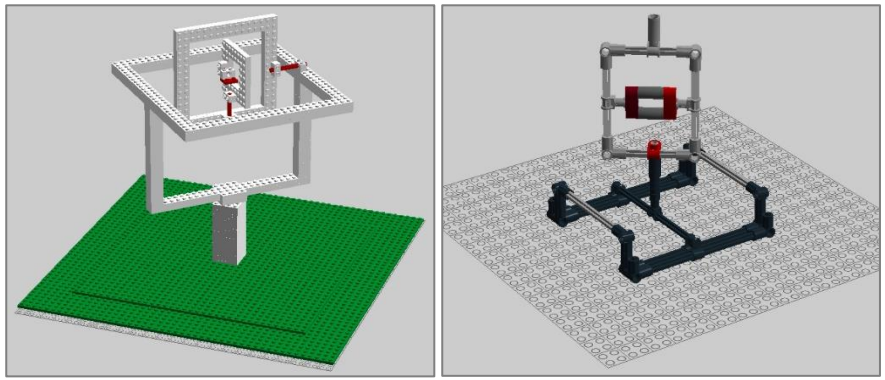
It covered the technical bases of representing 3D environments, technical sketching, computer-based modelling (using CAD tools SolidWorks and Lego Digital Designer) and physical modelling.



Student SolidWorks models (IAT 106, Spring'17)

Learning Outcomes

- Able to describe and use spatial thinking, use graphical representations and communication in different problem domains such as design, art, medicine, business, and engineering
- Able to examine and interpret 3D representations via drawings, computer-based models and physical models, visualize and define spatial problems and proposed solutions, create and manipulate 2D/3D representations of their solutions to given spatial problems,
- Able to select representation tools and techniques and make association among them when working on problems requiring spatial thinking and use a computer-based geometry-modeling tool (such as a Computer-Aided Design system / SolidWorks).



Student Lego Digital Designer models (IAT 106, Spring'17)

Drawing As Inquiry (IAT 208)

Spring'15

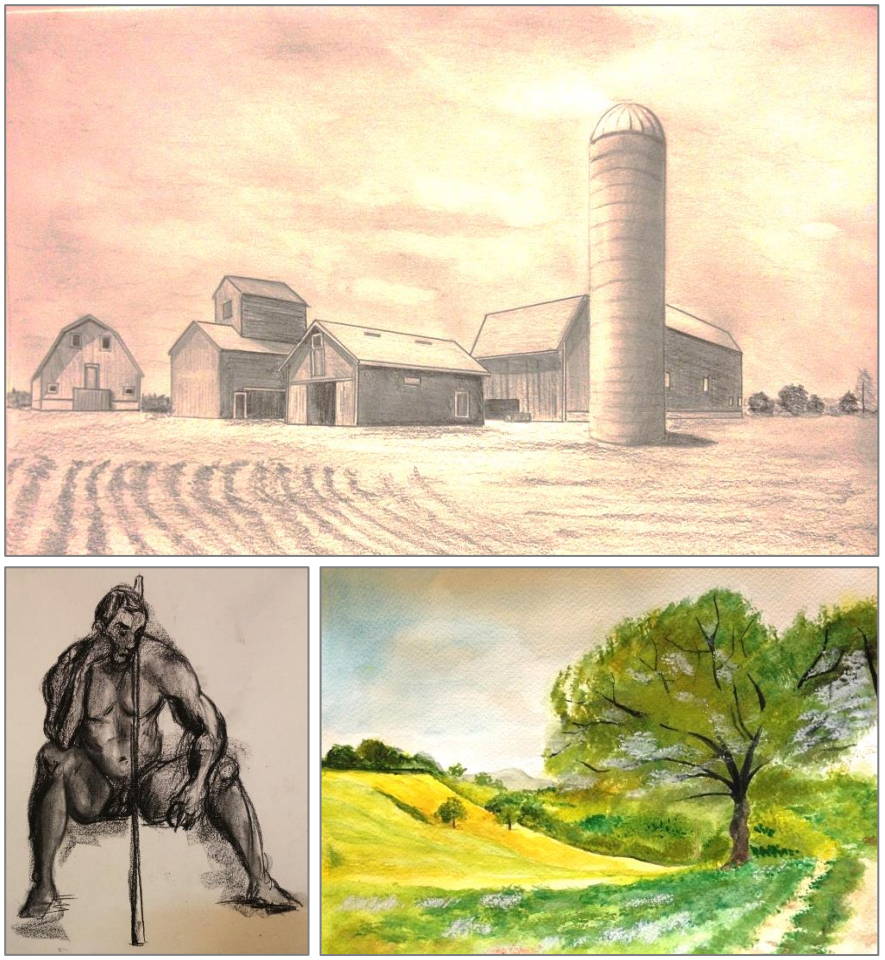
SIAT, SFU

This course presented an overview of various forms and languages of drawing as both a critical and creative research tool. Activities and projects in each unit offered opportunities to understand and apply drawing as a medium for visual thinking and conceptualization.

The course focused on improving visual perception and observation in order to draw and sketch subjects accurately. The representation of human forms, along with anatomical structures and proportions, were explored. Perspective rendering techniques were taught through studies of architectural forms, spaces and landscape. Composition and rapid visualization were taught in relation to storyboarding for time-based mediums such as film or animation and product conceptualization.

Learning Outcomes

- Able to render geometric and organic forms using a variety of media and styles
- Choose appropriate style of art periods, and apply in own work
- Determine appropriate stylistic mode in the construction of drawings
- Differentiate between appropriate media for drawing



Student sketches and drawings (IAT 208, Spring'15)

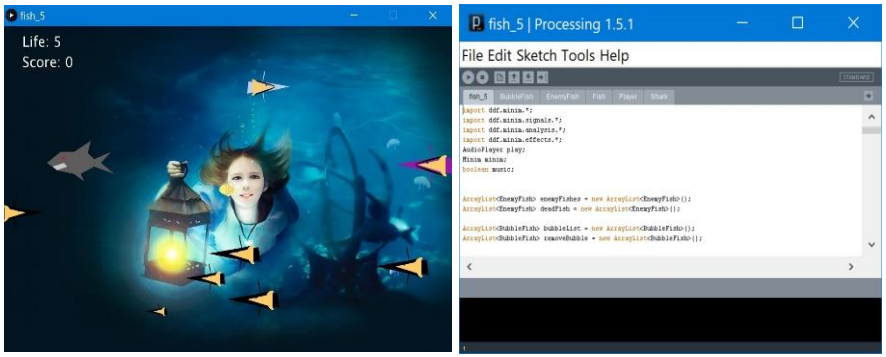
Multimedia Programming for Art and Design (IAT 265)

Fall'12

SIAT, SFU

This was a programming course that enhanced students' programming knowledge and skills so they were able to propose, design, implement and test complete interactive graphics/multimedia programs.

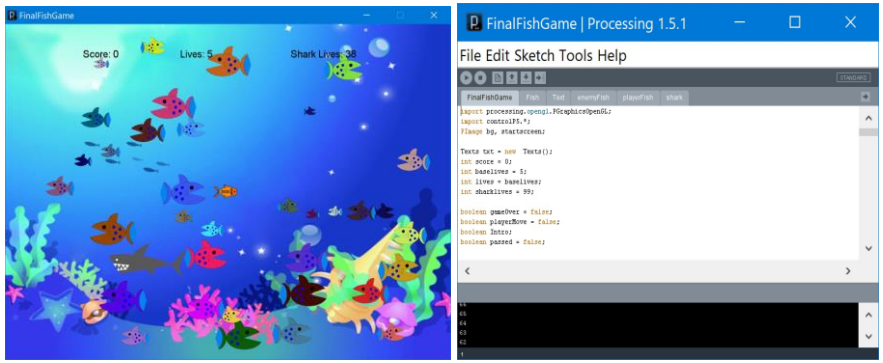
Students explored fundamental programming concepts and techniques related to graphics and animation, and used these skills to develop larger interactive multimedia applications. The course reinforced fundamental concepts of object-oriented programming such as classes, objects and inheritance.



Interactive Processing sketch (IAT 265, Fall'12)

Learning Outcomes

- Understand the fundamentals of software architecture, OOP (eg. interfaces and abstract classes), and multimedia programming within the context of interactive graphics applications.
- Design and document software, making appropriate use of UML diagrams and best practices.
- Able to make use of design patterns, appropriate data structures (eg. 1/2/3D arrays, lists, vector and trees), established external libraries and APIs in designing and implementing more complex applications.
- Able to explain and implement classic sorting algorithms.
- Use testing, debugging and refactoring to improve performance, readability, and maintainability of their code.



Interactive Processing sketch (IAT 265, Fall'12)