Creative Computing (4.0 units)
IMNY-UT 101 – 001 (4269) Tu/Th 2:30pm – 6:00pm (05/26 – 07/02)
David Rios 370 Jay Street, Room TBD

No prerequisites.

Physical Computing is an approach to learning how humans communicate through computers that starts by considering how humans express themselves physically. In this course, we take the human body as a given, and attempt to design computing applications within the limits of its expression.

To realize this goal, you’ll learn how a computer converts the changes in energy given off by our bodies (in the form of sound, light, motion, and other forms) into changing electronic signals that it can read and interpret. You’ll learn about the sensors that do this, and about simple computers called microcontrollers that read sensors and convert their output into data. In the other direction, you will learn how to actual physical things in the world with devices like speakers, lights and motors. Finally, you’ll learn how microcontrollers communicate with other computers.

To learn this, you’ll watch people and build devices. You will spend a lot of time building circuits, soldering, writing programs, building structures to hold sensors and controls, and figuring out how best to make all of these things relate to a person’s body.

Syllabus

Introduction to Computational Media (4.0 units)
ITPG-GT 2233 – 001 (4266) Mo/We 12:10pm - 3:05pm (05/27 - 07/01)
Allison Parrish 370 Jay Street, Room TBD

The 17th century philosopher Spinoza described "wonder" as a state of suspension in the mind, a paralysis resulting from a confrontation with something wholly new, disconnected from past experience such that judgements of whether it is good or bad are not possible. At this moment in time, we are caught in such a state of suspension with digital technologies. Creating computer applications instead of simply using them will provide you with a deeper understanding for the essential possibilities, limitations and unknowns of computation.

The first half of Introduction to Computational Media focuses on the fundamentals of programming the computer (variables, conditionals, iteration, functions, and objects) and includes a basic introduction to HTML5/DOM. The JavaScript-based 'p5.js' programming
framework is the primary vehicle for the class. All sections assume no programming experience at all.

The second half focuses on applying fundamental programming concepts to generate and manipulate various media including imagery, sound and text and data. This course assumes a working knowledge of JavaScript and the 'p5.js' programming framework.

### Syllabus

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This course introduces the Python programming language as a tool for reading and writing digital text. This course is specifically geared to serve as a general-purpose introduction to programming in Python, but will be of special interest to students interested in poetics, language, creative writing and text analysis. Weekly programming exercises work toward a midterm project and culminate in a final project. Poetics/text analysis topics covered include: the history of computer-generated writing in arts and literature; plain text transcription and character encodings; ethics and authorship in the context of computer-mediated language; poetic structure and sound symbolism; performance and publishing. Programming topics covered include: data structures (lists, sets, dictionaries); strategies for making code reusable (functions and modules); natural language processing; grammar-based text generation; predictive models of text (Markov chains and recurrent neural networks); and working with structured data and text corpora.

Prerequisites: Introduction to Computational Media or equivalent programming experience.

### Syllabus

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Data is ubiquitous. Yet, it’s often invisible. In this course, we will explore ways to create physical data visualizations using contemporary design and digital fabrication tools. Students will learn how to collect data, find interesting patterns, design creative digital models and build tangible pieces using laser cutters, 3D printers and woodworking tools. We will visualize everything from street performers in Washington Square to Instagram influencer trends. Topics related to creative coding, Arduino, artificial intelligence, projection mapping and traditional art-making techniques will also be discussed.
The World Wide Web has grown up to be a great platform for asynchronous communication such as email and message boards which has extended into media posting and sharing. Recently, with the rise of broadband, more powerful computers and the prevalence of networked media devices, synchronous communications have become more viable. Streaming media, audio and video conference rooms and text based chat give us the ability to create new forms of interactive content for live participants.

In this course, we’ll focus on the types of content and interaction that can be supported through web based and live interactive technologies as well as explore new concepts around participation. Specifically, we’ll look at new and emerging platforms on the web such as HTML5, WebSockets and WebRTC using JavaScript and Node.js.

Experience with web technologies are (HTML and JavaScript) are helpful but not required. ICM level programming experience is required. (Social Software, Internet, Video)

Syllabus

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Immersive Experiences (4.0 units)
ITPG-GT 2067 – 001 (4316) Tu/Th 3:20pm - 6:15pm (05/26 - 07/02)
Sarah Rothberg 370 Jay Street, Room TBD

What makes a work of art an "experience"? What do we mean when we say something is "immersive"? By working with a variety of technologies such as 360 video, VR, and virtual paintings, as well as reading and discussing interdisciplinary texts on experience design, game design, interactive art, students will gain an understanding of how to create immersive experiences with a focus on virtual reality headsets. The class will also touch on related technologies, methods, and fields including augmented reality and interactive installation. The primary software tool in this course will be Unity3d, with no previous experience required. Some basic media production skills and programming fundamentals are suggested.
For better or worse humanity is heading down the virtual rabbit hole. We’re trading an increasingly hostile natural environment for a socially networked and commercially driven artificial one. Whether it's the bedrooms of YouTube streaming stars, the augmented Pokestops of Pokemon Go, the virtual tourism of the latest humanitarian crisis or even the "airspace" of Airbnb; we are witnessing a dramatic transformation of what occupying space means.

So where are these dramatic spatial paradigm shifts occurring? Who owns and occupies these spaces? Who are the architects and what historical and ethical foundations are they working from? What world do they want to build for humanity and where does the creative individual fit into it? Will it be a walled garden, a role-playing adventure or a tool for creating more worlds?

The course will ask students to embrace the role of virtual architect, not in the traditional brick-and-mortar sense of constructing shelter, but in terms of the engagement with the raw concept of space. However, this virtual space must be considered and evaluated as a “site” that is activated and occupied by real people and all the limitations of physical space that they bring with them from the real world. This is the foundation of synthetic architecture; simulated space met with biological perception.

This conceptual architecture is free from the confines of physics but host to a whole new set of questions: How do we embrace the human factors of a dimensionless environment? How do we make or encourage meaningful interactions within the limits of current technology? New models of interaction must inform and shape the architecture of virtual space - what does that look like? How can architecture and aesthetics inform the creation of virtual environments and immersive narratives? How do we acutely consider the psychological and social impacts of the worlds we design and what is the metaphorical ground plane to make sense of this virtual world, unbound by physics?

Syllabus