Digital Development Workshop

Spring 2019 Studio Workshop

Instructor: Zach Pino (zach.pino@id.iit.edu)
Tuesdays 2:00pm to 5:00pm @ KI 227

Description

This recurring course teaches current and emerging electronics and programmatic prototyping tools, so that students are able to fluently develop their ideas into interactive and responsive outcomes. Digital Development challenges students to explore how a combined knowledge of design research methods, contemporary technologies, and engineering prototyping tools can contribute to better and more informed designed outcomes. Each semester, the course takes on a specific topic and a new set of technologies, allowing students to retake the course and acquire new skills and exposure to other technological prototyping tools.

Possible Topics To Be Explored

Independent Study in Interactive Object Design
Data and Actuation Matrices
Public Safety (Transit or Epidemiology)
Voice Design
Government Research Grant (HAVA Act Grant)

Format

Each class will be divided into an interactive tutorial focusing on a specific technical topic, followed by building time in which students will be presented with an assigned real-word challenge for their designs to conquer.

Weekly homework will task students with building circuits, writing code, and prototyping hardware.

Office Hours

These office hours are **always available** but require advance request. Other times can be arranged if needed via email.

Wednesdays 12:30pm-5pm
Thursdays 10pm-12pm, 2pm-5pm

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Learning Objectives

- Gain fluency with the Arduino, Raspberry Pi, and related prototyping platforms
- Find and implement open source code and libraries
- Write well-structured code in Python and Arduino-Flavored C++
- Develop perseverance through confronting technological limitations and failures
- Implement a wide variety of analog and digital sensors and synthesize the results into a computational understanding of the world
- Use mathematical, computational, and physics principles to address design problems

Requirements

- Command of Adobe Illustrator, InDesign, and Photoshop or equivalents
- Willingness to prototype many ideas quickly
- Comfortability with working in teams and providing honest critique

Tentative Course Outline (without Theme Content)

1. Introduction to Arduino Platform, Electricity, and Functional Programming
2. Simple Digital Sensors - Buttons and LEDs
3. Simple Digital Sensors - Light/Temperature Sensor and RGB LEDs
4. I2C Sensors - Accelerometers, Gyroscopes, IMUs
5. SPI Interfacing - Displays, Screens
6. Sound Collection and Analysis - Microphones and SD Card Data Collection
7. Proximity Detection - RFID and NFC
8. Kinetics · DC Motors and Servos
9. Product Hardening and Power Management
10. Data Visualization Tools and Accessing Internet Data
11. Project Worktime
12. Project Worktime
13. Project Worktime
14. Final Presentation

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Expectations

- Minimum 10 hours of outside-of-class idea development and execution time
- Weekly research and tutorial completion
- Weekly deliverables that may require excursions and/or materials sourcing
- Weekly uploads of code and circuit diagrams with questions for review

Grading

Students will be evaluated on the scope and ambition of their iteration and exploration, aesthetic quality of their work, participation and collaborative enthusiasm, and the clarity and legibility of their developed ideas.