

Computational Culture

Workshop at ArtEZ University of the Arts Arnhem, Interaction Design
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Content

The fabric of our everyday life is permeated by small, embedded machines that talk to each other, or, in other ways perform pieces of software that were written for them.

Computation, which was once situated in large mainframes in university departments, entered our homes with the personal computer. With the Internet it became distributed and networked. The smartphone brought it to the street, but did so largely by tying its users to large, centrally managed services, that are rather opaque in how (exactly) they function. This limited the possibilities to study, critique, and modify the code essential to daily interactions. (One can, for example, think of the algorithm that decides which posts show up in one's Facebook News feed - and which won't.)

Now that we're about to enter a time where powerful computation can be done on devices that are incredibly affordable, yet open, this workshop seeks to explore the novel possibilities for design and interactions afforded by machines that are so cheap they can e.g. be gifted to other people, sent in the mail, etc.

In this workshop, we will develop software sketches in Processing that will run on the Raspberry Pi Zero - a tiny computer running Linux, most prominently known for its \$5 sales price.

To realize our ideas, we will explore how software can be composed from existing components and libraries, which are part of the Free & Open Source ecosystem. In fact, most of the "heavy lifting" done behind our programs will be done in such a way - similarly to how Linux and other open source projects are powering many gadgets, appliances, cars, etc. We will discuss the specific social and historic contexts in which Linux came to be and continues to be built, and how we - as designers - can engage with the people and communities behind those projects.

Material

The Raspberry Pi Zero can be made to:

- Draw something to connected displays via HDMI or DVI cable
- Play back sound waves via HDMI cable
- Interface with various other USB devices (keyboard, mouse, printer, etc.)
- Act as a USB device when plugged into another computer (keyboard, mouse, mass storage, webcam, audio interface, etc.)
- Send and receive from the internet via WiFi
- React to the press of physical buttons and position of switches
- Communicate via different indicator lights and LCDs
- Be used with or without a display attached
- Be powered from a USB charger, a battery, or a computer's USB port
- Be a source of heat :)
- (...)

You will be provided with example Processing sketches for many of those.

Project

Out of the box, the Raspberry Pi Zero is pretty boring. Turn the generic computational *scaffolding* into a funky, customized *house* that embodies exactly one *thing* (algorithm, interaction, etc.), according to your design.

Design and build a custom enclosure that further contributes to the situation or experience you're trying to create.

You are encouraged to base your program on one of the template Processing sketches provided. Other approaches are also encouraged, but should be individually discussed.

Required reading

Occasional reading material will be sent at least two days before each meeting.

Schedule

April 4, 1:15 - 4:30pm

- Introductions
- First steps with the Raspberry Pi Zero
- Printer example

April 13, 1:15 - 4:30pm

- Thinking about device art, artist/film GUIs, Shanzhai
- UNIX terminal introduction
- Writing code for the Pi Zero using Processing
- Brainstorming

April 20, 1:15 - 4:30pm

- Sketches on paper due
- Blender tutorial
- Physical interfaces (buttons, LCDs)

April 27, Koningsdag: no meeting

May 4, Meivakantie: no meeting

May 11, 1:15 - 4:30pm

- Group review
- How to source parts
- Individual feedback & support

May 18, 1:15 - 4:30pm

- Thinking about kickstarter, unboxing
- Individual feedback & support

May 25, 1:15 - 4:30pm

- Project due
- Presentation, Discussion

Other

Feel free to get in touch in person, or via email, about any question, concern, feedback you might have!