Swan Carpenter

swanio@duck.com
+1 (978) 626 4774
thingsbyspoon.cc
github.com/pitworker

Swan is a software engineer creating highly interactive tactile experiences and machines.

Education

Carnegie Mellon University
Class of 2021
Bachelor of Computer Science and Arts
Focus in CS and Environments Design
QPA 3.61, College Honors

Relevant Coursework

Computer Science
Computer Systems
Parallel & Sequential Algorithms
Theoretical Ideas in Computer Science
Principles of Imperative Computation
Applied Machine Learning
Robotics for Creative Practice
Conlanging with Language Technologies
Matrices and Linear Transformations
Calculus in Three Dimensions
Probability

Design
Environments Design I, II, III
Algorithmic Textile Design
Experimental Capture
Futures
Systems
How People Work

Skillset

Embedded, Native
C
C++
Rust
Python
Java
C#
QMK
Arduino
RP2040 (ARM)
Embedded Linux

Web
TypeScript
NodeJS
WebAssembly
Google Cloud
Cloudflare

Multimedia
TouchDesigner
FFMPEG
Unity

Protocols
REST
WebSockets
OSC
Bluetooth (BLE)
USB HID
MIDI
DMX

Mobile
Android Studio
Dart/Flutter
Swift/XCode

Management
Git
Bash/Shell

Honors and Awards

Armero Award for Inclusive Creativity
2021
Capstone Project Award for *Zobits*

Pittsburgh AAF Award
2023
Gold for *Netflix Stranger Things Clock*

National American Advertising Award
2023
Gold for *Doodles Genesis Factory*

Work Experience

Embedded Software Engineer | studio5C
October 2023 - Present
Building interactive devices at product and kiosk scales; using **C**, **Python**, **TouchDesigner**, **ARM** (RP2040), **USB HID**, and **REST**. Clients include Deeplocal, Nik Bentel Studio, Magic Circle Game Studio, and Mars.

Software Engineer | Deeplocal
June 2021 - May 2022 (lvl. 1), May 2022 - October 2023 (lvl. 2)
Leading software development, designing **system architectures**, and writing **embedded code** for award-winning, networked, interactive machines; using **Rust**, **Python**, **TouchDesigner**, embedded **Linux**, **MIDI**, **DMX**, **REST**, and **OSC**. Clients include Google, Meta, Netflix, TikTok, Museum of the Future, and Virgin.

UX Prototyping Intern | Motional (Aptiv-Hyundai JV)
June 2020 - August 2020
Prototyping and developing functional demo of a 3D map view within the management software for a large fleet of autonomous vehicles; using **JavaScript**. Designs have since been implemented into the production software.

UX Prototyping Intern | Aptiv
July 2019 - August 2019
Designing and implementing interactive, location-based, contextual UI elements for in-car passenger displays in autonomous vehicles; using **Java** and **Android Studio**.

Notable Work

Nik Bentel Electronic Bags | Professional
Expected launch December 2024
Developed and integrated electronics for a series of mass-produced handbags with unique features including a sound mixer, Bluetooth speaker, and portable game console.

Orthomacs Keyboard | Personal
Completed August 2024
Conceived, designed, and developed a split ergonomic **USB** keyboard optimized specifically for use with the Emacs text editor. Built on an **RP2040** architecture with a unique matrix design and **QMK**-based firmware written in **C**.

Google Marketing Live Pinball | Professional
Launched May 2023
Led development of **Unity** (**C#**) based software for a set of three custom pinball machines for Google's Marketing Live event. Software scope encompassed sensing from, and triggers to, in-game hardware features, scoring, game mechanics, and in-game cutscenes.

Highmark "How's It Going?" | Professional
Launched May 2023
Built out an embedded server using **Rust** and **Tokio** to maintain a queue of user-generated survey data being simultaneously created, edited, and removed by multiple visitor- and staff-facing clients via **REST** and **WebSockets**. Presented as part of the launch event for Highmark's "How's It Going?" campaign.

Mobile-Powered Synthesizer | Professional
Completed September 2022
Contributed to a mobile web app and accompanying **SDK** for a line of Android phone powered **MIDI** synthesizers. Was responsible for major pieces of the **JavaScript/DOM** website and **Dart/Flutter** mobile app, as well as **documentation** for the app's SDK.

Zobits | Personal
Completed May 2021
Developed **Arduino**-based electronics and collaborated on **Unity**-based mobile app for a creative toy with which users create digital biomes by selecting from a set of **Bluetooth**-enabled magnetic organism figures. Generated biomes develop over the course of a week, with varying levels of success determined by a genetic algorithm written in **Java**.

Zoöid | Personal
Completed March 2020
Led development of electronics and software for a line of eight networked fashion pieces featuring synchronized, animated LED components. Outfits were built on an **Arduino**-based platform and synchronized via **2.4GHz radio** communication between each outfit and a local server.