

# Swan Carpenter

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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

<b>Embedded, Native</b>	<b>Web</b>
C	TypeScript
C++	NodeJS
Rust	WebAssembly
Python	Google Cloud
Java	Cloudflare
C#	
QMK	<b>Multimedia</b>
Arduino	TouchDesigner
RP2040 (ARM)	FFMPEG
Embedded Linux	Unity
<b>Protocols</b>	<b>Mobile</b>
REST	Android Studio
WebSockets	Dart/Flutter
OSC	Swift/XCode
Bluetooth (BLE)	
USB HID	<b>Management</b>
MIDI	Git
DMX	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 | Freelance**  
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 handbags featuring unique functionalities including a sound mixer, Bluetooth speaker, and videogame controller.

**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.