

# Jacob Sharf, Software Engineer with Machine Learning Focus

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## SUMMARY

Experienced in bringing proof-of-concept prototypes to production. Breadth of experience in software engineering, machine learning, and hardware prototyping. Depth of experience in C++, Python, and Systems software.

## EXPERIENCE

**Research Engineer** - *Cornell Language, Interaction, and Learning Lab*

2021-09-20 - Present

<https://cb2.ai/>

Research platform for Natural Language Processing (NLP) interactions. Created dataset of grounded language instructions in collaborative asymmetric user scenarios. Online demo serves live multi-modal model on website, simulated self-play, and dataset management.

- Dataset of 500+ interactions played on AWS mechanical turk
- Optimized Python for low latency game server (1-5ms server latency)
- Client in Unity and C#. Distributed via WebGL
- ACL 2023 system demo paper; preprint available at [arxiv.org/abs/2303.08127](https://arxiv.org/abs/2303.08127)

**Software Engineer** - *Alphabet*

2015-07-21 - 2021-08-04

Developed systems software. C++ and Python. Realtime distributed systems. Software Reliability.

- Platforms (2 yrs): GPU and Accelerator cloud deployment. Signed binary distribution and system software
- Daydream (2.5 yrs): High-accuracy position-tracked VR controller firmware. Bluetooth low-latency sensors
- Devices & Services (0.5 yrs): Consumer device SW. Google Pixel Buds A-series factory bring-up
- Waymo (1 yr): Deterministic simulation framework. HITL (Hardware-in-the-loop) testing and presubmit service
- Received C++ Readability Certificate

**Internship, Flight Software** - *SpaceX*

June, 2014 - Sep, 2014

Dragon spacecraft crew communication firmware. Realtime audio codecs and HW prototyping. C++ and Python

**Internship, Static Analysis** - *Coverity*

June, 2013 - Sep, 2013

Performance analysis tools for Coverity's static analysis software. Python

**Student Research, CASIT** - *UCLA Center for Advanced Surgical and Interventional Technology*

Prototyped smart lower limb prosthetic device.

April, 2012 - October, 2012

## PROJECTS

**Plasticity Neural Network Framework**

C++ Machine Learning Framework from scratch with symbolic differentiation and GPU acceleration. Demonstration model achieves 88% on the CIFAR-10 dataset, trained overnight on home computer. <https://github.com/jsharf/plasticity>

**Argos Smart Camera**

A home apartment monitor that uses cheap, ubiquitous wifi webcams to create a smart camera system. <https://github.com/jsharf/Argos>

## VOLUNTEERING

**Stanford Code in Place - Weekly Section Leader, Code in Place 2021 & 2022**

<https://codeinplace.stanford.edu/>

Weekly section lead for 10 students. Taught introductory Python course.

## EDUCATION

**University of California**

Bachelors - Computer Science

2011-08-01 - 2015-06-20