

# Zachary Oliver Birenbaum

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## EDUCATION

### Colgate University – Bachelor of Arts in Computer Science

Hamilton, NY

- 3.5 Cumulative GPA – Magna Cum Laude

August 2020 – May 2022

### Purdue University – Computer Science Major

West Lafayette, IN

- 3.6 Cumulative GPA – Dean's List

August 2017 – December 2019

## WORK EXPERIENCE

### Software Engineer – Backend | July 2022 – Present

Independent Consultant | Remote

- Cloud and Blockchain engineer for California based startup providing services such as leveraging the Google Cloud Functions and Web3 NodeJS APIs to implement serverless applications for executing the view functions of smart contracts and syncing updates to a Cloud Firestore database
- Contracted by San Francisco based Data as a Service (DaaS) startup to write backend APIs in Java and Go using gRPC and Protocol Buffers as well as implement and encourage DevOps best practices

## RESEARCH & INTERNSHIPS

### Software Engineer – Research | Summer 2021 – April 2022

Colgate University | Hamilton, NY

- Designed and implemented a vectorized, GPU-accelerated Stochastic Simulation Algorithm using CUDA C++
- Developed a convolutional neural network architecture to enable substantially higher predictive performance than benchmark models such as FaceNet for datasets with limited class examples using TensorFlow and OpenCV
- Leveraged the DLIB and OpenCV C++ libraries to develop a data processing pipeline for transforming raw photos into cropped and aligned model inputs for use by biologists in ecological studies.

### Data Engineer – Research | Summer 2019

Purdue University | West Lafayette, IN

- Collaborated in weekly meetings with Purdue Machine Learning and Cybersecurity faculty along with our counterpart teams at DARPA and NASA to improve an engine for detecting and preventing malicious messages sent to secure institutions or high-profile individuals via unconventional methods like LinkedIn

### Software Engineer – Finance | Summer 2019

T-Mobile US, Inc. | Bellevue, WA

- Developed detailed test cases for firm's internal accounting system utilizing Python and SQLAlchemy which generated excel outputs containing customer contract breakdown by device and account, alongside other relevant details for ease of intra-team and QAT usage

### Data Analyst – Machine Learning | Summer 2018

Verizon Communications Inc. | Basking Ridge, NJ

- Leveraged big data and machine learning solutions such as Amazon Athena to generate insights into Verizon's Interactive Voice Response system which were forecasted to provide a \$3MM increase in operating income

## PROJECTS

### Codex-Language-Server

- Language server protocol (LSP) for OpenAI Codex written in Typescript to serve as an alternative to GitHub Copilot and provide extended features such as code completion, documentation generation, and AI-assisted bug fixing in development environments such as VSCode, Neovim, and Emacs

### Copilot.lua & Copilot-cmp

- Neovim plugin utilized by numerous other plugins written by myself and others providing an efficient and extensible API for interfacing with the official NodeJS GitHub Copilot language server
- Completion source for nvim-cmp which makes use of the copilot.lua API for obtaining suggestions from GitHub Copilot as a user types, which can be displayed or inserted from a highly customizable popup menu

### Notable Open-Source Contributions

- [Sorin-Ionescu/Prezto](#) (12,900+ Stars, 4,500+ Forks, 306+ Contributors)
- [Neovim/Neovim](#) (57,500+ Stars, 4000+ Forks, 830+ Contributors)
- [NvChad/NvChad](#) (11,800+ Stars, 700+ Forks, 120+ Contributors)

Maintainer  
Contributor  
Core Developer

## SKILLS & INTERESTS

**Languages & Lines of Code:** (10,000+) Python, C, Lua (3000+) C++, Java, JavaScript (1000+) Go, CUDA, Bash Zsh

**Tools & APIs:** Docker, Google Cloud, gRPC, OpenAPI, Doxygen, TensorFlow, AWS

**Linux Administration:** 8 years of experience using Linux as a primary OS and maintaining personal servers

**Colgate Coders:** Organized and led workshops on how to make open-source contributions and navigate the command line

**Personal Hobbies:** Scuba diving, bouldering, traveling, reading, writing code that helps people write better code

## RESEARCH PUBLICATIONS

Birenbaum, Z., Do, H., Horstmyer, L., Orff, H., Ingram, K., & Ay, A. (2022). SEALNET: Facial recognition software for ecological studies of harbor seals. *Ecology and Evolution*, 12, e8851. <https://doi.org/10.1002/ece3.8851>