Dawson Metzger-Fleetwood
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EDUCATION

University of Maryland — **College Park, MD**
B.S., Computer Science with Machine Learning Specialization — December 2022
B.S., Finance — Cumulative GPA: 3.65
- Deans List — 9/10 semesters
- Taisto Saloma Scholarship — Fall 2017-18

SKILLS

Programming: Python, Swift, JavaScript, TypeScript, React, PHP, Java, Matlab, C/C++, Objective-C, HTML/CSS, SQL
Software: UNIX, VSCode, Xcode, Matlab, Firebase, AWS, Git/Github, Docker, RealityKit, Three.js, Tensorflow, PyTorch, HuggingFace, LangChain, Pandas, Farama Gymnasium/PettingZoo, Bloomberg Terminal, Microsoft Office, Google Suite
Languages: German (proficient), American Sign Language (proficient), Cued English (fluent)

WORK EXPERIENCE

About Objects. — **Reston, VA**
Software Engineer — July 2023 - Present
- Led development of a 3D object recognition pipeline for Vision Pro, enabling detection and rotation inference from 200 images.
  - Supported use case for a horizontal oil drilling company to analyze industrial drill bit components, surfacing history, quality, and repair procedures.
  - Researched and implemented innovative approaches that garnered interest from Apple.
- Worked extensively on VisionOS, iPadOS, and iOS projects, specializing in AR/VR development using RealityKit.
- Wrote software to automate the company's billing process, from sending reminders to generating reports.
- Led the development of About Object's new website. Incorporated custom graphics using Three.js, wrote multiple custom plugins for WordPress and a from-scratch PHP server.
- Built LLM toolchains for enterprise and government clients.
  - Processed unstructured documents into structured data models for app visualization.
  - Created pipelines to populate official forms from structured data models or detailed text descriptions, tailored to meet stringent enterprise and government formatting requirements.
- Selected to lead the company's AI blog, writing articles on autoencoders, reinforcement learning, and connecting transformers to graph neural networks.

Visual Language Associates, Inc — **Silver Spring, MD**
Technical Co-Founder — September 2019 - July 2023
- Co-founder of an agency that provides signed language interpreting and cued language transliteration services, successfully securing contracts with the MD state government, and serving over two dozen clients in the DMV area with an average contract value of over $90,000.
- Served as a cued language transliterator, directly providing interpretation/transliteration services to consumers.
- Responsible for coordinating scheduling with school officials and other interpreters and transliterators, as well as preparing and leading language and policy training sessions. Assisted with recruiting, onboarding, and sales.
- Developed methodology to screen employees, clients, and contracts, as well as match clients with service providers.
- The Auto-cuer was developed for Visual Language Associates.

Chipotle — **Bethesda, MD**
Crew and Lead Griller — June 2018 — September 2019
- Served in all crew positions; food prep, dishwasher, customer service line, but mainly grill.
- Responsible for training new grillers and preparing/coordinating all catering operations (sometimes for 100+ people).
- As lead griller, lead the grill staff to score a perfect health/sanitation rating from the MD Office of Food Protection.

Washington Waldorf School — **Bethesda, MD**
IT and Maintenance Support — May 2015 — June 2018
- Conducted maintenance work throughout the school, including installing infrastructure wiring, maintaining and updating IT systems, and debugging network issues.

TECHNICAL EXPERIENCE

Personal Projects
Self-Study: Reinforcement Learning — Python — Fall 2023
- Engaged in a rigorous self-study of reinforcement learning, using OpenAI's "Spinning Up," and reading *Reinforcement Learning: An Introduction* by Sutton and Barto cover to cover
- Implemented foundational RL algorithms from scratch, including SARSA, DQN, PPO, DDPG, SAC, and Monte Carlo Tree Search.

Swift ML Inference Library — Swift — Spring 2024
- Collaborated with a colleague to develop a Swift library for fast model training and inference, with the goal of showcasing Swift's potential as a standalone ML development language without reliance on C++.
- Designed the library to run entirely on the stack, avoiding performance degradations from heap usage.
- Utilized experimental Swift features such as non-copyable types and non-escapable closures, and created custom tensor types optimized for Apple's Unified Memory Architecture.

- Included common features such as a GGUF decoder.

Protein Timing App — Swift Spring 2022

- Developed an app using Swift and SwiftUI to help athletes time protein intake throughout the day.
- "Amino Amigo" is currently available on the iOS App Store, and has been downloaded in 11 countries including the UK, Australia, Brazil, Sweden, France, Angola, and New Zealand.
- The app factors in individual metabolic limits and alerts users to when - and how much - protein to have.
- Development included exposure to the full software development life cycle across the full application stack.
- The app followed the MVC model, Apple's interface guidelines, and made use of a wide variety of Swift features and frameworks including animations, advanced gestures, Unit testing, MapKit, CoreLocation, CoreData, and Firebase.

Auto-cuer — Python Fall 2022

- Created a speech to cued English transliterator using OpenAI's whisper API. Designed to be used in place of captioning for non-literate deaf individuals (e.g. young children).
- Designed to be deployable at scale, with full documentation and a suite of automated testing.

University of Maryland

Computer Vision — Matlab Fall 2021

- Created four computer vision applications from scratch; object recognition and distance estimation software, a panorama stitching app, an Adobe rotobrush clone, and a drone location/flightpath tracker using raw camera data.
- Some of the techniques used included: GMMs, alternate color spaces (e.g. YCbCr), convolution, ANMS, RANSAC for homography estimation, cylindrical projection, bilinear interpolation for image blending, image segmentation using localized classifiers, motion estimation with color and shape models, SfM, SLAM, factor graphs, and GTSAM.

Computer Systems Architecture — C/C++ and Assembly Fall 2022

- Developed an assembly language and error-checking software using only bit shifting, characters, and arrays in C.
- Implemented Tomasulo's algorithm, four branch predictors (G-share, Two-Level Adaptive, etc), and three cache coherency protocols (MOESI, etc) for parallelized processors (from 4 to 16 cores).
- Wrote Python scripts for extensive testing of different architectures/hyper-parameters.

Introduction to AI/Machine Learning — Python Spring 2022

- Implemented many foundational ML algorithms from the ground up, including neural networks, simulated annealing, PCA, softmax regression, gradient descent, A* search, and decision trees. Heavy use of linear algebra was required.
- Implemented Kalman filters, particle filters, and Bayes nets to teach a car to race around a simulated track.
- Made heavy use of object-oriented design patterns for code organization, and GitHub for cross-team collaboration.
- Used ensemble methods and neural networks to predict a chess player's ELO given raw game moves as input.

ACTIVITIES/AFFILIATIONS

Startup Shell **College Park, MD**

Fellow September 2022 - Present

- Startup Shell is UMD's student-run startup incubator, founding home of ventures collectively worth over $1 billion.
- As a fellow, was available to consult and assist on all aspects of product development for a variety of ventures.
- Some ventures that launched during my tenure included a prompt engineering website with over 100,000 monthly visitors and a discord server with over 5,000 active members, a farmland valuation AI model, and a patient management platform for underfunded hospitals in Africa.

Boy Scouts of America **Colesville, MD**

Eagle Scout September 2012 — September 2016

- Planned and participated in a wide variety of wilderness and survival activities including monthly camping trips all over the U.S. and a two week backcountry backpacking trip at Philmont in New Mexico.
- Participated and led over 100 hours of community service including food and gift drives, trail maintenance, habitat restoration, and assisting local nonprofits (e.g. churches, charities).
- Planned and executed an Eagle Scout Project. For my project I built a weatherproof bulletin board in front of the troop's host church, complete with shingled roofing.
- Served as Patrol Leader, Assistant Patrol Leader, Troop Chaplain, and Assistant Senior Patrol Leader.
- Order of the Arrow Member.