

Hayden Whitley

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Researcher with 4+ years of experience solving unique problems using Computer Vision, Machine Learning, and AI

EDUCATION

University of Maryland, College Park

- *M.S., Chemical Engineering - Autonomous Characterization Techniques* *Expected December 2025*
 - Publications in top-5 material science journals Nature Nano. and Nature Comm.
 - Masters thesis project spun off into company that received \$100K grant from Maryland Innovation Initiative
 - Selected as paid lecturer for Machine Learning for Chemical Engineers
 - Recognized as top 3% of masters students and awarded research stipend
- *B.S., Chemical Engineering, Minor Computer Science* *Sept. 2020 to May 2024*
 - Selected as paid Teaching Assistant for Fundamentals of Chemical Engineering
 - Chosen as one of two student representatives for the department to design engineering curriculum
 - Earned 2 scholarships totaling \$15k from National Merit Society and Blackhorse Veterans Memorial
 - Accepted (top 2%) into startup incubator, Awarded 4x Dean's List, 2nd Place Undergraduate Research Competition

WORK EXPERIENCE

Machine Intelligence Accelerated Materials Innovation Laboratory

University of Maryland, College Park

Graduate Researcher

February 2022 to Current

- Developed 1st bio-plastic from all-natural materials for diverse single-use plastic replacements
- Constructed generative models to generate 1000s of accurate recipes from <300 experiments (100X less than standard)
- Delivered automated solution for labor-intensive material testings, e.g., strength, under \$20k budget and within 3-months
- Led team of 5 collaborators across 3 labs to publish in 30+ impact factor journal and create proof of concept product

Maryland Robotics Center

University of Maryland, College Park

Automation Consultant

February 2023 to Current

- Developed autonomous solutions for 5 research groups to incorporate into novel R&D processes

MateriAI, startup transforming material design process for industry using machine learning and AI

Boston, MA

Platform Design Lead

October 2024 to Current

- First employee at materials design consulting startup with 5 clients and \$60k revenue (to date)
- Lead team of 3 full-stack developers building minimal viable product, leading to 4 customer acquisitions
- Conceptualized modular backend infrastructure to decrease server costs by 50%
- Project managed 4 accounts in specialized material design solving for formulation optimization using AI

Physical Sciences Inc., contract R&D, \$150M ARR, 300 employees

Andover, MA

Internship

May 2023 to August 2023

- Received 1st place in poster competition for algorithm research among cohort of interns, received return offer
- Contributed to team of 15 developing algorithm to improve thick through-barrier detection accuracy by 80%
- Trained model to conform available external datasets for research and testing purposes and expand training library

PUBLICATIONS

Total of 4 publications in review or published and selected as the coverage of Engineering Department news

- Chen, T., Pang, Z., He, S., ..., **Whitley, H.** *et al.* Machine intelligence-accelerated discovery of all-natural plastic substitutes. *Nat. Nanotechnol.* (2024).
- Shrestha, S., Barvenik, K.J., Chen, T., ..., **Whitley, H.** *et al.* Machine intelligence accelerated design of conductive MXene aerogels with programmable properties. *Nat Commun* 15, 4685 (2024).
- Predictive and Generative Modeling of Mixed Dimensional Aerogels with Programmable Properties *In submission*
- Advancing Zn-Ion Battery Electrolytes with Robotic Experimentation and Machine Intelligence *In submission*

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, TypeScript, HTML/CSS, Java, C, Rust, C#, SQL, G-code, Bash, Slurm

Frameworks: PyTorch, TensorFlow, NextJS, React, Flask, .NET, MongoDB, ROS, ROS2, Unix, CUDA

Software: Microsoft Word, Excel, Powerpoint, Github, Spyder, VS Code, VS Studio, Anaconda, Jupyter, Figma

Certificates: Udemy CV, Udemy ROS2, Udemy NLP, Hugging Face Deep RL, NAUI diving license

PROJECTS

BBR Battle Simulator (bbrbattle.com) - implemented Deep Q-Learning based battle simulator for Axis & Allies board game

- Launched with more than 10 active users and accumulated to a community of 200+

Simplex Optimization (simplexsolver.xyz) - Solve linear programming word problems using agentic workflow

- Built tool that was incorporated into Design Principles course taken by 50+ students per semester