Caleb Biddulph

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Github | LinkedIn | Portfolio

SUMMARY

Cornell University student with over 5 years of programming experience, eager to find a challenging research position.

EDUCATION

Cornell University
Computer Science, BS
Expected May 2023 | Ithaca, NY
College of Engineering
Dean's List
GPA: 3.706 / 4.0

COURSEWORK

Spring 2021
Reinforcement Learning
Functional Programming
Computer Vision
UNIX Tools and Scripting
Fall 2020
Machine Learning
Computer Organization
Probability and Statistics
Spring 2020
Object-Oriented Programming
Linear Algebra
Differential Equations
Fall 2019
Discrete Structures
Multivariable Calculus
Operations Research

SKILLS

Languages:
Python • Java • C • OCaml • Swift
JavaScript • HTML5 • CSS • Ruby

Tools:
VS Code • Vim • UNIX • Xcode
Unity Game Engine • Ruby on Rails

RESEARCH INTERESTS

Artificial Intelligence
Game Theory
Reinforcement Learning
Algorithms

EXPERIENCE

CAPE CRYSTAL | Research Assistant
September 2020 – Present | Ithaca, NY

- Classified crystal structures in Python based on Stukowski paper [arXiv]
- Implemented BFS to partition nearby particles of the same classification
- Classified more varied and complex structures using K-Means
- Processed data on lab's Linux cluster and analyzed it with Matplotlib

ECHOAR | Software Engineer Intern
September 2020 – November 2020

- Wrote backend functionality to download and zip associated files with Java
- Created a demo of the company's AR technology in Unity 3D [GitHub]

CORNELL AUTONOMOUS BICYCLE | Project Team Member
February 2020 – Present | Ithaca, NY

- Implemented the Pure Pursuit path-following algorithm in Python, allowing the team's robotic bike to follow a route without human intervention
- Integrated VFH algorithm [paper] with Pure Pursuit to avoid obstacles
- Converted routes from Google Maps API into lists of coordinates

THREE BEARS | Software Engineer, Entrepreneur
May 2020 - August 2020

- Developed a website in Ruby on Rails that allows users to record life events
- Designed an interactive timeline interface in HTML, CSS, and JavaScript
- Pitched business plan for ORIGIN Bootcamp, a summer program for startups

PROJECTS

POLYGON ART GENERATOR [GitHub]

- Developed Python program that synthesizes polygon art from photos
- Program reduces unappealing jagged edges by decreasing color variance per triangle to under 50% compared to the naive solution

NEURAL NETWORK / ADVERSARIAL ATTACKER [GitHub]

- Designed a white-box algorithm that adds noise to an MNIST image to fool a neural network into misclassifying it as a given digit
- Adversarial images differ from original by only 2%

"CAMEL UP" AI PLAYER [GitHub]

- Designed an AI in Java to play a non-deterministic strategy board game
- Used Monte Carlo analysis to select moves given game state and history

LEADERSHIP/AWARDS

- Academic Officer in the Association of CS Undergraduates at Cornell
- Cornell Orientation Leader, Fall 2020 - mentored incoming students
- 1st place in the world - Destination Imagination Scientific challenge
- Eagle Scout, one of ~300 Scouts in history to earn every merit badge
- Rookie All-Star and Highest Seed Award - FIRST Robotics Competition
- 4th place of 22 - Games Factory Jam 5