

# Daniel Engbert

SOFTWARE ENGINEER

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## Education

### Vrije Universiteit

M.S. ARTIFICIAL INTELLIGENCE (COGNITIVE SCIENCE TRACK)

Amsterdam, Netherlands

Aug. 2022 - July 2024

### University of Maryland Baltimore County (UMBC)

B.S. COMPUTER SCIENCE, MINOR IN MATHEMATICS. GPA: 3.73/4.0 (CUM LAUDE)

Baltimore, MD

May 2019

## Experience

### Robotic Research LLC

CONSULTANT SOFTWARE ENGINEER

Gaithersburg, MD

Jan. 2022 - Aug. 2022

- Developed a full-stack cloud application for storing, querying, and accessing data from autonomous robotic systems.
- Developed a cloud deployment system (using terraform), allowing engineers to easily deploy the application across multiple environments. Created an extensive unit test system, continuously validating the application's functionality and security over time.

### Scale AI

PRODUCT ENGINEER

San Francisco, CA

Feb. 2021 - June 2021

- Developed a full stack (self-service) tool for customers to upload data (images, documents, etc) and receive a labeled dataset for training their AI algorithms. Automated assigning workers to labeling a project's data, managing their assignment with automated training courses and quality control mechanisms (using React, Node.js, and MongoDB).
- Presented system demos and provided support for customers to reach their project goals; ultimately enabling higher quality datasets for their machine learning applications.

### Robotic Research LLC

SOFTWARE ENGINEER

Gaithersburg, MD

June 2019 - Jan. 2021

- Supported the development of autonomous software for the electric shuttle "Olli." Lead the deployment/mapping process for new autonomous routes across several cities.
- Led the creation of a web app for searching/downloading data (stored in the cloud) collected from fleets of autonomous vehicles around the world (utilizing Flask, and various AWS services).
- Trained a neural network to perform vehicle detection on synthetic datasets and evaluated the performance on real-world images.

COMPUTER VISION INTERN

June 2018 - Aug. 2018

- Trained/evaluated a neural network (Mask R-CNN) on several (autonomous vehicle related) datasets to perform object detection and wrote Python scripts to combine various datasets into a common format for training. Created a C++ camera driver for a computer vision system in a ROS pipeline.

### UMBC

TEACHING ASSISTANT (TA)

Baltimore, MD

Aug. 2018 - May. 2019

- Worked as a TA for an object-oriented programming and design C++ course. Led a weekly lab section to help students understand the week's material while evaluating their lab projects. Helped students understand and overcome obstacles (e.g. debugging) with course projects each week during office hours and assisted the professor with grading/proctoring exams.

PRIVATE TUTOR

Feb. 2018 - Dec. 2018

- Worked as a personal tutor for a C++ data structures course, helping students to deeply understand course concepts while fostering their ability to perform independent problem solving/learning while tackling course projects.

RESIDENT ASSISTANT (RA)

Aug. 2016 - May. 2018

- Managed a floor of 30 students for two years and prepared educational programs related to diversity, culture, wellness, study skills, etc.

### AT&T

SOFTWARE DEVELOPER INTERN

Columbia, MD

May. 2017 - Dec. 2017

- Improved a network security tool by writing shell scripts to manage a Hive database built on top of a Hadoop Distributed File System, and by integrating a deep packet inspection C library into the tool. Participated in (Agile) code reviews and sprint planning.

### Imaging Research Center at UMBC

FULL STACK WEB DEVELOPER INTERN

Baltimore, MD

June 2016 - Aug. 2016

- Helped develop retrieverstories.umbc.edu, a custom social media site for current/former students to share their experiences. Developed new features using PHP, SQL, HTML, and CSS.

# Projects

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## A.I. Algorithms

- Implemented a feed forward neural network from scratch in Python using NumPy and evaluated the performance on the MNIST dataset after studying the linear algebra and calculus needed to implement backpropagation through an online course.
- Implemented the Hill Climbing and Simulated Annealing optimization algorithms in Python to optimize employee shift schedules with respect to a heuristic function.
- Implemented a decision tree for data classification, the K-Means classification algorithm, various graph search algorithms, and the tf-idf algorithm for practicing NLP.

## Computer Vision

- Implemented an algorithm to stitch overlapping images together into a panorama. Used Harris Corner Detection to identify key points in each image, and the RANSAC algorithm to identify the best points to use to compute a perspective transformation for aligning the images.
- Implemented image classifiers (distinguishing dogs and cats) using a Support Vector Machine (SVM), and the K-Nearest Neighbor (KNN) algorithm. Experimented with different methods of generating descriptors for image features (e.g. SIFT descriptors) and evaluated performance using K-Fold cross validation.
- Implemented (as a research project) a traffic light detector algorithm using Histogram of Oriented Gradients (HOG) features, a Support Vector Machine (SVM). Applied the model to test images using a Gaussian pyramid with a sliding window.

## Ray Tracer

- Implemented a ray tracer in C++ capable of rendering images and videos of 3D scenes with shading, shadows, and reflections. Also implemented a rasterizer and 3D mesh smoother algorithm. This project used a heavy amount of applied linear algebra and was implemented from scratch.

## Personalpedia

- Developed a website serving as a personal wiki / learning tool for writing, and reviewing notes. I've integrated custom tools for importing notes from my Kindle, practicing foreign languages, and integrated with the Anki flashcard program for long term memory recall. The site is implemented in React.js with a Flask/Python backend hosted on AWS.

## global-board.org

- Designed and implemented a website to help users learn about every country (showing what's trending and embedding learning resources specific to each country's history, travel, and culture). Implemented with React, Node.js, PostgreSQL, and hosted on Google Cloud.
- Using the Spotify, and Twitter APIs (to track trends across countries) and the YouTube API to automatically find the best educational videos about each country.

# Skills

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<b>Programming Languages</b>	Python, C++, C, bash, JavaScript, HTML, CSS, SQL, MongoDB, R, Java.
<b>Frameworks &amp; Tools</b>	React, Node.js, Flask, Docker, Apache, NGINX, ROS, Android Studio, Git, SVN.
<b>Cloud Technologies</b>	AWS: EC2, S3, Elastic Beanstalk, Lambda, Step Functions. <a href="#">Google Cloud</a> : App Engine. Terraform.
<b>Design Software</b>	SolidWorks, SketchUp, GIMP (photo editing), DaVinci Resolve (video editing).
<b>Electronics</b>	Extensive Arduino and PIC microcontroller experience.
<b>Foreign Languages</b>	Spanish (fluent), Portuguese (conversational).

# Activities & Achievements

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## CLUBS AND VOLUNTEERING:

- Volunteered with a Gurdwara (Sikh place of worship) to help with a food drive service for people in need during Covid.
- Volunteered with the UMBC Environmental Task Force Club (cleaning up trash in the woods around campus on a weekly basis).
- Volunteered as a personal tutor for a Computer Science course.
- UMBC Hackers Club member (participated in 5 hackathon competitions).

## TRAVEL:

- I've backpacked through over 15+ countries across 4 continents while practicing languages and exchanging experiences with countless people from all over the world. I've completed over 6 weeks of solo travel (to locations including the Amazon rainforest).
- Attended various language exchange meetups/clubs in cities across the world.

## HIGH SCHOOL INVOLVEMENT:

- Eagle Scout (2014), National Honor Society member.
- Green Team (environmental club) Vice President, FIRST Robotics club (national championship participant).
- Varsity Volleyball and Tennis athlete.