# Angelos Mavrogiannis

Cell: (240) 663-1876
angelosm@cs.umd.edu
https://angmavrogiannis.github.io Last Update: Sept 2024

## Education

**University of Maryland, College Park (UMD)** Aug 2020 – Summer 2025 (exp.)
Doctor of Philosophy (PhD), Computer Science
Thesis: "Translating Natural Language to Visually Grounded Verifiable Action Plans"
Advisor: Prof. Yiannis Aloimonos

**University of Maryland, College Park (UMD)** Dec 2023
Master of Science (MS), Computer Science
Coursework: Robotics, Trustworthy ML, Computer Vision, Decision-Making for Robotics, Deep Learning, Computational Linguistics, Interactive Data Analytics, HCI
GPA: 3.74/4.00

**Carnegie Mellon University (CMU)** May 2020
Master of Science (MS), Mechanical Engineering
Thesis: "Human Driver Behavior Classification from Partial Trajectory Observation"
Advisor: Prof. Changliu Liu
Selected Coursework: Advanced Control & Reinforcement Learning, Deep Learning, Mechanics of Manipulation, Machine Learning, Robot Design & Experimentation, Linear Control Systems, Engineering Computation
GPA: 3.92/4.00

**University of Patras (UoP)** July 2017
Bachelor of Science (BS) & Master of Engineering (MEng), Mechanical Engineering
Concentration: Mechanical Design & Manufacturing
Thesis: "Environment Development for Implementing Design Optimization Using Parsers and Genetic Algorithms"
Advisor: Prof. Argyris Dentsoras
GPA: 8.03/10.00 (top 10% in a class of 150 students)

## Honors & Awards

**ICRA@40 Travel Grant** 2024
IEEE Robotics and Automation Society
**NSF AccelNet Grant** 2024
NeuroPAC Project: Neuromorphic Perception, Action, and Cognition

**Scholarship for 4th Summer School on Social Human-Robot Interaction** 2023
**IROS Student and Developing Countries Travel Award** 2022
IEEE Robotics and Automation Society
**Jacob K. Goldhaber Travel Grant** 2022
**International Conference Student Support Award (ICSSA)** 2022
**Computer Science Department Travel Grant** 2022
Department of Computer Science, The Graduate School, University of Maryland
**Gerondelis Graduate Study Scholarship** 2022
Gerondelis Foundation
**Dean's Fellowship** 2020-2022
Department of Computer Science, University of Maryland
**Fulbright Scholarship** 2018-2020
Fulbright Foundation
**Carnegie Mellon Mechanical Engineering MS Research Symposium Award** 2020
Department of Mechanical Engineering, Carnegie Mellon University
**Duke Mech. Eng. & Materials Science Graduate Scholarship** (declined) 2018
Duke University
**Andreas Mentzelopoulos Scholarship** 2018-2020
University of Patras
**Harry D. Triantafillu Scholarship** 2018
Harry D. Triantafillu Scholarship Fund - Institute of International Education

# Research Experience

**Graduate Research Assistant**
Department of Computer Science, University of Maryland

Perception and Robotics Group (PI: Prof. Yiannis Aloimonos) January 2022 – Present

- Research in the intersection of robotics and NLP (RoboNLP).
- Discovering Object Attributes by Prompting Large Language Models with Perception-Action APIs (under review: https://arxiv.org/abs/2409.15505, presented at ICRA@40 in Rotterdam, Netherlands)
- Cook2LTL: Translating Cooking Recipes to LTL Formulae using Large Language Models (paper: https://ieeexplore.ieee.org/document/10611086, presented at ICRA 2024 in Yokohama, Japan)

Gamma Group (PI: Prof. Dinesh Manocha) Sept 2020 – December 2021

- B-GAP: Behavior-Rich Simulation and Navigation for Autonomous Driving (RA-L 2022 letter: https://ieeexplore.ieee.org/document/9716825, presented at IROS 2022 in Kyoto, Japan)

**Graduate Research Assistant** Jan 2019 – May 2020
The Robotics Institute, Carnegie Mellon University
Intelligent Control Lab (PI: Prof. Changliu Liu)

- Developed a machine learning framework (PyTorch, Scikit-Learn) for classifying human driver behaviors based on partial trajectory observations and applied it to vehicle trajectory prediction.
- Designed and created a data-driven simulator on Python for visualizing vehicle trajectories.
- Master thesis available at: https://www.researchgate.net/publication/345780499_Human_Driver_Behavior_Classification_from_Partial_Trajectory_Observation

**Graduate Research Assistant** Sept 2018 – Dec 2018
Department of Mechanical Engineering, Carnegie Mellon University
Computational Engineering and Robotics Lab (PI: Prof. Kenji Shimada)

- Research on the design and control of an underwater, hull-cleaning robot (code in C++, communications through ROS, project funded by Tsuneishi Shipbuilding Co. Ltd and supervised by Prof. Kenji Shimada).

**Undergraduate Research Assistant** Nov 2016 – July 2017
Mechanical Engineering and Aeronautics Department, University of Patras
Machine Design Laboratory (PI: Prof. Argyris Dentsoras)

- Developed a software tool (Visual Basic) for automatic parsing of optimization problems from mathematical expressions into numerical code and solving them using Genetic Algorithms (Diploma Thesis project).
- Demonstrated the efficacy of the tool in robotic grasping applications and specifically via minimizing the forces applied onto an object grasped by a robot arm.

# Teaching Experience

**Teaching Assistant**
Department of Computer Science, University of Maryland, College Park

CMSC 122: Intro to Computer Programming via the Web Spring 2023, Fall 2023-2024
Undergraduate Course, taught by Jen Manly, Pedram Sadeghian

- Holding weekly office hours and grading quizzes, projects, and exams.

CMSC 131: Object-Oriented Programming I (Java) Spring 2024
Undergraduate Course, taught by Pedram Sadeghian

- Held weekly office hours and graded assignments and exams.

CMSC 426: Computer Vision Fall 2022
Undergraduate Course, taught by Prof. Yiannis Aloimonos

- Held weekly office hours and graded projects and exams.

CMSC 216: Introduction to Computer Systems Spring 2022
Undergraduate Course, taught by Larry Herman

- Taught weekly lectures on C programming, UNIX process control, and Assembly language.
- Held weekly office hours and offered assistance to a class of over 500 students.

CMSC 106: Introduction to C Programming Fall 2021
Undergraduate Course, taught by Prof. Jan Plane
- Hosted weekly lab sessions on C programming in a UNIX environment.
- Provided debugging assistance to a class of more than 50 students.
- Held weekly office hours, created and graded assignments and projects.

**Course Assistant**
Department of Mechanical Engineering, Carnegie Mellon University

24-775: Robot Design & Experimentation Spring 2020
Graduate Course, taught by Prof. Aaron Johnson
- Advised students on robot design projects, organized and supervised group meetings and graded assignments and projects.

24-281: Introduction to Scientific Computing Spring 2019, Fall 2019
Undergraduate/Graduate Course, taught by Dr. Zhenguo Nie, Dr. Hugo Penelas
- Delivered MATLAB recitations, held weekly office hours, created and graded weekly assignments.

24-686: Advanced Mechanical Design Fall 2018
Graduate Course, taught by Prof. Rahul Panat
- Offered SolidWorks recitations, held weekly office hours and designed/graded assignments and projects.

# Internships

**Artificial Intelligence – Artificial Intelligence Engineer Intern** Summer 2024
LinkedIn Corporation, San Francisco, California
- Orchestrated a vLLM- and HuggingFace-powered batch inference pipeline to generate LLM member and ad campaign embeddings.
- Integrated the embeddings as input features into a two-tower recommendation model for embedding-based retrieval.
- Trained the model towards expanding the target audience of a campaign and outperformed the existing baseline in production.

**Artificial Intelligence – Machine Learning Engineer Intern** Summer 2023
LinkedIn Corporation, Mountain View, California
- Fine-tuned state-of-the-art open-source Large Language Models towards optimizing LinkedIn's audience targeting pipeline.
- Outperformed the existing audience targeting module that was used in production at that time.

**Artificial Intelligence – Machine Learning Engineer Intern** Summer 2022
LinkedIn Corporation, Mountain View, California

- Developed a Real-Time Bidding environment for second-price auctions on OpenAI gym.
- Modeled a multi-constraint bidding problem for ad optimization using a Constrained Markov Decision Process (CMDP).
- Trained a Deep Reinforcement Learning policy that can outperform the company's currently used automatic bidding policy.

**Jr. Technical Superintendent** Summer 2012, Summer 2013
Euronav Ship Management Hellas Ltd, Athens, Greece

- Interned in the technical department of the company and assisted with various day-to-day tasks.
- Reviewed weekly fleet reports to analyze and optimize on-ship oil and energy consumption.

# Skills

**Programming**
Python, C/C++, MATLAB, SQL, Scala, Visual Basic, Fortran

**Machine Learning Libraries/Toolkits**
Huggingface, spaCy, Tensorflow, PyTorch, OpenCV, Scikit-Learn, Open AI Gym

**Engineering Software**
ROS (Robot Operating System), AI2-THOR, Gazebo, Solidworks, Catia, AutoCAD

**Technologies**
Linux, Git, Apache Spark, Hadoop

**Languages**
English (Fluent, TOEFL 115/120, CPE University of Cambridge 2008)
French (Intermediate, DALF C2 2010)
Greek (Native)

# Teamwork & Class Projects

**Evaluating the Fairness of Diffusion-based Face Generation** Fall 2023
CMSC 848I: Trustworthy Machine Learning, taught by Hal Daumé III, UMD

- Designed a pilot study that mines information about users' facial features by asking them LLM-generated questions.
- Evaluated the fairness of a diffusion model on face reconstruction based on the information extracted during the pilot study.

**VR-Integrated Real-Time Racetrack Simulator** Spring 2023

CMSC 730: Interactive Technologies in HCI, taught by Huaishu Peng, UMD

- Proposed and led a group project on building a 3D-printed chessboard-resembling racetrack and an interactive system that converts it to a VR-simulated racing environment.
- Implemented the entire computer vision module, tracking the position and orientation of the pieces using ArUco markers and mapping them to poses and ego-vehicle control commands in a simulated racetrack in Unity.

**Predictive Modeling Using Linguistic Signal for Suicidality** Spring 2021

CMSC 723: Computational Linguistics, taught by Jordan Boyd-Graber, P. Resnik, UMD

- Proposed a modified Hierarchical Attention Network architecture to assess the potential suicide risk of reddit users based on their post history.
- Extracted post-level features based on users' emotional states and tuned a Latent Dirichlet Allocation (LDA) model to retrieve meaningful subreddit clusters.

**News Scraper (Full Disclosure Project)** Spring 2021

CMSC 828D: Interactive Data Analytics, taught by Leilani Battle, UMD

- Collaborated with a team of students to develop an application that continuously scrapes the web for articles related to potential police misconduct.
- Developed an NLP-based algorithm that assigns a probability score to scraped articles based on their potential indication of police misconduct.

**Automatic Parking using Reinforcement Learning** Fall 2020

CSMC 828W: Foundations of Deep Learning, taught by Soheil Feizi, UMD

- Presented a Curriculum Learning-based setup for the efficient training of a Reinforcement Learning policy on autonomous parking.
- Demonstrated the benefits of the proposed approach in parking environments of varying traffic density on an OpenAI gym-based simulator.

**Reinforcement Learning-based Object Placement on Small Surfaces** Fall 2020

CMSC 818B: Decision-Making for Robotics, taught by Pratap Tokekar, UMD

- Realigned a Reinforcement Learning-based Pick-and-Place approach to an approximation of object stacking upon small surfaces.

**Sentiment Analysis on Audiovisual Speech Samples** Spring 2020

24-789: Deep Learning, taught by Amir Barati Farimani, CMU

- Collaborated with a team of students to develop a multi-modal deep learning framework for extracting the sentiment of a short audiovisual speech sample.
- Implemented a deep neural network which receives text as input and outputs the polarity of the given text (positive/negative sentiment).

**Autonomous Vehicle Controller Design** Fall 2019

24-677: Linear Control Systems, taught by Ding Zhao, CMU

- Designed a lateral and a longitudinal controller to track the route of an autonomous vehicle around the CMU campus.
- Investigated various methods for improved performance (PID, pole placement, Discrete Time Infinite Horizon LQR) and used Kalman Filter for noise filtering.

**Bioinspired Robot Design** Spring 2019
24-775: Robot Design & Experimentation, taught by Aaron Johnson, CMU

- Collaborated with a team of students to design and manufacture an underwater penguin-inspired robot.
- Incorporated a ball-and-socket motion transmission mechanism for the movement of the flippers.
- Designed a control system using Arduino microcontroller and tested the robot in underwater environments.

**Game Design** Fall 2018
24-780: Engineering Computation, taught by Nestor Gomez, CMU

- Implemented applications with 3D graphics and audio programming, using C++ and the openGL library.
- Orchestrated a team project on the development of an interactive entertainment software package (a fighting game).

**Manipulation Project** Fall 2018
16-741: Mechanics of Manipulation, taught by Matt Mason, CMU

- Collected a synthetic dataset of manipulator postures and object poses in OpenAI Gym.
- Trained a multilayer perceptron in order to map changes in hand pose to object displacements.
- Modified the OpenAI Gym simulator to demonstrate the predicted object pose and validated the method on occluded object tracking problems.

**Computational Robotics Project** Fall 2016
MEA-KY3: Robotics, taught by Nikos Aspragathos, UoP

- Developed forward and inverse kinematics software in Matlab for a KUKA KR 6 R700 sixx WP industrial robot.
- Applied the framework to trajectory planning problems and visualized the joint and end-effector trajectories.

# Extracurricular Coursework

**The Machine Learning Summer School (MLSS) in Okinawa** March 2024
Okinawa Institute of Science and Technology (OIST), Riken AIP

**4th Summer School on Social Human-Robot Interaction** Sept 2023
Human Interactivity and Language Lab, IEEE Robotics and Automation Society

**DISC Summer School 2021 for Planning, Learning and Control for Multi-Robot and Multi-Agent Systems** June 2021
Dutch Institute of Systems and Control

**Robotics & AI Summer School** June 2021
IRI - Institut de Robòtica i Informàtica industrial, CSIC-UPC

**3rd ACM Summer School in Data Science** July 2019
Association for Computing Machinery

# Outreach

**Paper Reviewing**

- IEEE TPAMI Sept 2024
- IEEE ICRA 2025 Sept 2024
- IEEE ICRA 2024 Oct 2023
- IEEE IROS 2023 March 2023

**Intelligent Control Lab Tour**, Carnegie Mellon University May 2019

- Presented the lab equipment and gave a brief talk for a group of students from Choate Rosemary Hall.

**Makerspace and Machine-Shop Tour**, Carnegie Mellon University December 2018

- Gave a tour of the makerspace and the machine-shop to a group of CMU kindergarten kids.

**F1 in Schools, 4x4 in Schools**, Athens, Greece May 2018

- Constructed a set of different racetracks and supervised the F1 in Schools STEM Challenge.
- Collaborated with a team of engineers to inspect and validate F1 and 4x4 student-designed vehicles.