

# Angelos Mavrogiannis

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## Education

**University of Maryland, College Park (UMD)** Aug 2020 – May 2025 (exp.)  
Doctor of Philosophy (Ph.D.), Computer Science  
Current Research: Visual Question Answering  
Advisor: Prof. Yiannis Aloimonos  
Selected Coursework: Computer Vision, Robotics, Decision-Making for Robotics,  
Foundations of Deep Learning, Computational Linguistics, Interactive Data Analytics  
GPA: 3.62/4.00

**Carnegie Mellon University (CMU)** May 2020  
Master of Science (M.S.), 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  
Diploma (Dipl.-Ing.), Mechanical Engineering and Aeronautics  
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

**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

- Developing a Visual Question Answering system for grounding spatial relations and executing Human-Robot Interaction tasks.

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

- Introduced a behavior-based Reinforcement Learning policy-training scheme for behavior-guided action prediction and local navigation for autonomous vehicles. (paper published at RA-L 2022: <https://ieeexplore.ieee.org/document/9716825>)

### 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](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 216: Introduction to Computer Systems

Spring 2022

Undergraduate Course, taught by Larry Herman

- Teaching weekly lectures on C programming, UNIX process control, and Assembly language.
- Holding weekly office hours and offering assistance to a class of 500 students.

CMSC 106: Introduction to C Programming

Fall 2021

Undergraduate Course, taught by Prof. Jan Plane

- Hosting weekly lab sessions on C programming in a UNIX environment.
- Providing debugging assistance to a class of more than 50 students.
- Holding weekly office hours, creating and grading assignments and projects.

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.

## Skills

### Programming

Python, C/C++, MATLAB, SQL, Visual Basic, Fortran

### Machine Learning Libraries/Toolkits

Tensorflow, PyTorch, OpenCV, Scikit-Learn, Open AI Gym

### Engineering Software

ROS (Robot Operating System), Gazebo, Solidworks, Catia, AutoCAD

### Technologies

Linux, Git

### Languages

English (Fluent, TOEFL 115/120, CPE University of Cambridge 2008)

French (Intermediate, DALF C2 2010)

Greek (Native)

## Teamwork & Class Projects

### 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

**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 2021** June 2021

IRI - Institut de Robòtica i Informàtica industrial, CSIC-UPC

**3<sup>rd</sup> ACM Summer School in Data Science** July 2019

Association for Computing Machinery

**Machine Learning** Spring 2019

Online course taught by Prof. Andrew Ng, offered by Stanford University through Coursera.

**Introduction to Computer Science and Programming Using Python** Fall 2013  
Online course taught by Prof. Eric Grimson, offered by MIT through edx.

**Startup Engineering** Fall 2013  
Online course taught by Prof. Balaji Srinivasan, offered by Stanford University through Coursera.

## Internships

**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.

## Outreach

**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.