

# Angelos Mavrogiannis

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<https://amavrogiannis.com>

Last Update: Nov 2019

## Education

### **Carnegie Mellon University (CMU)**

Aug 2018 – May 2020 (exp.)

Master of Science (M.S.), Mechanical Engineering

Thesis: “Human Driver Behavior Classification from Partial Trajectory Observation”

Advisor: Prof. Changliu Liu

Selected Coursework: Mechanics of Manipulation, Introduction to Machine Learning, Robot Design & Experimentation, Linear Control Systems, Engineering Computation

GPA: 4.00/4.00

### **University of Patras (UoP)**

July 2017

Diploma, Mechanical Engineering and Aeronautics

Concentration: Mechanical Design & Control

Thesis: “Environment Development for Implementing Design Optimization Using Parsers and Genetic Algorithms”

Advisor: Prof. Argyris Dentsoras

GPA: 8.03/10.00 (top 10%)

## Honors & Awards

### **Fulbright Scholarship**

2018

Fulbright Foundation

### **Duke Mech. Eng. & Materials Science Graduate Scholarship** (declined)

2018

Duke University

### **Andreas Mentzelopoulos Scholarship**

2018-2019

University of Patras

### **Harry D. Triantafillu Scholarship**

2018

Harry D. Triantafillu Scholarship Fund - Institute of International Education

### **Participant, 3<sup>rd</sup> ACM Summer School in Data Science**

2019

Association for Computing Machinery

## Research Experience

### Graduate Research Assistant

Jan 2019 – Present

The Robotics Institute, Carnegie Mellon University

Intelligent Control Lab (PI: Prof. Changliu Liu)

- Trained recurrent neural networks (PyTorch) for intention and trajectory prediction on autonomous driving applications based on NGSIM datasets.
- Developed a MATLAB framework for visualization and comparison of ground truth and predicted trajectories of vehicles in highway and intersection driving scenarios.
- Conducted a survey on the comparison of state-of-the-art methods used for vehicle behavior prediction.

### Graduate Research Assistant

Sept 2018 – Jan 2019

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 Mechanical Engineering, Carnegie Mellon University

24-281: Introduction to Scientific Computing

Spring 2019, Fall 2019

Undergraduate/Graduate Course, taught by Dr. Zhenguo Nie, 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**

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

### **Machine Learning Libraries/Toolkits**

PyTorch, Open AI Gym

### **Engineering Software**

Solidworks, Catia, AutoCAD

### **Technologies**

Linux, ROS, Git

### **Languages**

English (Fluent, CPE, University of Cambridge 2008)

French (Intermediate, DALF C2 2010)

Greek (Native)

## **Teamwork & Class Projects**

### **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**

### **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.