

# Anastasios Vlachos

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## EDUCATION

### ETH Zürich

Master of Science in Information Technology and Electrical Engineering

Zürich, Switzerland

Sep. 2022 - present

- **Specialization:** Systems and Control
- **Projected GPA:** 5.4/6

### National Technical University of Athens (NTUA)

Diploma in Electrical and Computer Engineering (5-year degree; 300 ECTS)

Athens, Greece

Sep. 2015 - May 2021

- **Major:** *Signals, Automatic Control and Robotics & Electronics, Circuits and Materials*
- **Minor:** *Computer Systems & Mathematics*
- **GPA:** 8.94/10.00 (ranked 24<sup>th</sup> among 342 graduates of 2021)
- **Thesis:** “Mathematical Analysis of  $\Sigma\Delta$  Modulators and Applications in Frequency Synthesis and Stochastic Filtering”  
Supervisor: Prof. Paul P. Sotiriadis, Grade: 10/10

## RESEARCH EXPERIENCE

### Automatic Control Laboratory (IfA), ETH Zürich

Master Thesis

Zürich, Switzerland

Sep. 2024 - present

- Worked on studying the influence of constraints on Linear Quadratic Tracking problems.
- Provided theoretical complexity bounds that captured the aforementioned influence.
- Conducted numerical simulations that verify these bounds.
- Supervised by Aren Karapetyan, Dr. Anastasios Tsiamis, Dr. Efe Balta and Prof. Dr. John Lygeros.

### Automatic Control Laboratory (IfA), ETH Zürich

Semester Project

Zürich, Switzerland

Oct. 2023 - Mar. 2024

- Worked on bridging offline and online prediction methods in the problem of Pedestrian Tracking.
- Proposed a method to adapt online to the residual errors of offline-trained models.
- Provided Regret guarantees for our method and conducted simulations to showcase its efficacy.
- Supervised by Dr. Anastasios Tsiamis, Aren Karapetyan, Dr. Efe Balta and Prof. Dr. John Lygeros.

### Circuits and Systems Group (Prof. P.P. Sotiriadis), NTUA

Diploma Thesis - Undergraduate Research Assistant

Athens, Greece

Mar. 2020 - Dec. 2021

- Completed my diploma thesis by examining  $\Sigma\Delta$  modulators from a dynamical-systems viewpoint and presenting their usefulness in Frequency Synthesis and Stochastic Filtering applications.
- Resulted in publication at MOCAST 2021 (nominated for **Best Paper Award**) and an invited journal paper.

## PUBLICATIONS

- [1] **A. Vlachos**, A. Tsiamis, A. Karapetyan, E. C. Balta, and J. Lygeros, “Online residual learning from offline experts for pedestrian tracking,” *arXiv preprint arXiv:2409.04069*, 2024.
- [2] N. Temenos, **A. Vlachos**, and P. P. Sotiriadis, “Efficient stochastic computing fir filtering using sigma-delta modulated signals,” *Technologies*, vol. 10, no. 1, p. 14, 2022.
- [3] **A. Vlachos**, N. Temenos, and P. P. Sotiriadis, “Exploring the effectiveness of sigma-delta modulators in stochastic computing-based fir filtering,” in *2021 10th International Conference on Modern Circuits and Systems Technologies (MOCAST)*, IEEE, 2021, pp. 1–4.

## NOTABLE PROJECTS

### Off-Policy Doubly Robust Policy Gradient

Project of the course “Foundations of Reinforcement Learning”

Mar. 2024 - Jun. 2024

- Project on deriving an off-policy Doubly-Robust Policy Gradient estimator and perform bias and variance analysis on it, showcasing its performance.
- Conducted experiments on *CartPole* environment that corroborate our theoretical analysis.

### Comparing averaging methods in Constrained Consensus

Project of the course “Advanced Topics in Control - Distributed Control”

Apr. 2023 - Jul. 2023

- Project on constrained consensus protocols and attitude synchronization of a swarm of satellites using averaging quaternions algorithms.

## Wall-Following and Localization tasks for Sonar Robot

May 2019 - Sep. 2019

Summer project at the Intelligent Robotics and Automation Lab, NTUA

- Initialized from semester project in Intelligent Robotic Systems course, where we implemented Wall Following and Localisation tasks for a sonar robot, through simulations using ROS-Gazebo.
- Extended the project by testing our algorithms under real conditions on a Raspberry-Pi, three-wheel, DC-motor, sonar robot.

## HONORS AND AWARDS

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**Papakyriakopoulos Award** for excellence in Mathematics among the 2<sup>nd</sup> year ECE NTUA students.

## TEACHING EXPERIENCE

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### Linear Systems Theory (ETH Zürich)

Autumn 2023, 2024

Teaching Assistant

- Consult on the clarity, correctness and difficulty of the proposed homework and grade the homework submissions of students, on a biweekly basis.

### Advanced Topics in Control - Distributed Systems and Control (ETH Zürich)

Spring 2024

Teaching Assistant

- Grade the homework submissions of students, on a monthly basis, and provide grades statistics.

## TECHNICAL SKILLS

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**Programming Languages:** Python, Matlab, C/C++

**Software Frameworks:** PyTorch, Scikit-Learn, NumPy,

**Simulation Tools:** ROS-Gazebo

**Other Tools:** Latex

## LANGUAGES

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**English**(fluent, C2), **German**(intermediate, B1), **Greek**(native)