Anastasios Vlachos

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Education

ETH Zürich — Zürich, Switzerland
Master of Science in Information Technology and Electrical Engineering — Sep. 2022 - present

- **Specialization**: Systems and Control
- **Current GPA**: 5.3/6

National Technical University of Athens (NTUA) — Athens, Greece
Diploma in Electrical and Computer Engineering (5-year degree; 300 ECTS) — 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$^{\text{th}}$ 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 — Zürich, Switzerland
Semester Project — 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. John Lygeros.

Circuits and Systems Group (Prof. P.P. Sotiriadis), NTUA — Athens, Greece
Diploma Thesis - Undergraduate Research Assistant — 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 — Mar. 2024 - Jun. 2024
Project of the course "Foundations of Reinforcement Learning"

- 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 — Apr. 2023 - Jul. 2023
Project of the course "Advanced Topics in Control - Distributed Control"

- 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 Rasberry-Pi, three-wheel, DC-motor, sonar robot.

Honors and Awards

Papakyriakopoulos Award for excellence in Mathematics among the 2nd year ECE NTUA students.

Teaching Experience

Linear Systems Theory 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 Spring 2024
Teaching Assistant

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

Technical Skills

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

Software Frameworks: PyTorch, Scikit-Learn, NumPy,

Simulation Tools: ROS-Gazebo

Other Tools: Latex

Languages

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