Spilios Evmorfos

☐ +1 9086368667 • ✉ spilios.evmorfos@rutgers.edu • google scholar

○ github • LinkedIn

Research Interests

My research revolves around developing novel deep learning and deep reinforcement learning approaches to enhance the performance of Wireless Autonomous Systems. Such systems seamlessly integrate sensing, processing/learning, and communication. Furthermore, I am interested in methods to bolster the robustness of deep reinforcement learning algorithms. Finally, I explore the use of deep generative modeling in order to solve combinatorial problems arising in engineering applications. I have a significant interest in time series prediction using deep learning (Recurrent Neural Nets/ Transformers) and, generally, in ways to merge signal processing and deep learning in order to process data that exhibit temporal dependencies.

Education

PhD in Electrical and Computer Engineering   **New Brunswick, NJ, USA**
Rutgers, the State University of New Jersey   *09/2020-present*

○ General Focus: Deep Learning for Wireless Autonomy
○ Supervisor: Athina Petropulu
○ GPA : 4.0/4.0

Diploma (BEng & MEng) in Electrical and Computer Engineering   **Athens, Greece**
National Technical University of Athens   *09/2012-10/2018*

○ Thesis Topic: *Neural Network Architectures for the Detection of SYN Flood Attacks in IoT Systems*
○ GPA : $8.32/10$ (top 10% among graduating students)

High School Diploma   **Athens, Greece**
Doukas Lyceum (full academic scholarship for 3 years)   *09/2009-06/2012*

○ Highest Honors, top 0.1% in National Qualification Exams, GPA: $19,698/20,000$

Professional Experience

Siemens Technology - Autonomous Systems Group   **Princeton, NJ, USA**
Research Scientist Intern   *05/2023-08/2023*

Research on deep reinforcement learning for electric vehicle motor control (using PyTorch and SimCenter Studio).

Rutgers, the State University of New Jersey   **New Brunswick, NJ, USA**
Teaching Assistant   *01/2023-05/2023*

Responsible for the coding part of the Digital Signal Processing course (teaching sessions in MATLAB).

Siemens Technology - Autonomous Systems Group   **Princeton, NJ, USA**
Research Scientist Intern   *05/2022-08/2022*

Research on unsupervised pretraining approaches for deep Q learning (PyTorch).
The developed approaches were applied on the control environments of the DeepMind Control Suite.

Rutgers, the State University of New Jersey   **New Brunswick, NJ, USA**
Teaching Assistant   *01/2022-05/2022*

Responsible for the coding part of the Digital Signal Processing course (teaching sessions in MATLAB).

Institute of Communication and Computer Systems   **Athens, Greece**
Junior Researcher   *02/2018-06/2020*

Research on deep learning for time series forecasting and its application to the detection of Distributed Denial-of-Service (DDoS) attacks in IoT systems.

○ Used Python and Wireshark to create annotated time series datasets of network traffic packets.
○ Developed recurrent deep learning approaches for the detection of DDoS attacks using PyTorch.

Publications/Patents

[1] **Evmorfos, S.**, Petropulu, A., Poor, H.V. *"Actor-Critic Methods for IRS Design in Correlated Channel Environments: A Closer Look into the Neural Tangent Kernel of the Critic"*
IEEE Transactions on Signal Processing, 2023.

[2] **Evmorfos, S.**, Xu, Z., Petropulu, A. *"GFlowNets for Sensor Selection"*
IEEE International Workshop on Machine Learning for Signal Processing, 2023. (Best Student Paper Award)

[3] **Evmorfos, S.**, Kalogerias, D., Petropulu, A. *"Adaptive Discrete Motion Control for Mobile Relay Networks."*
Frontiers in Signal Processing, 2022. **[paper]**

[4] **Evmorfos, S.**, Petropulu, A. *"Deep Actor-Critic for Continuous 3D Motion Control in Mobile Relay Beamforming Networks"*
IEEE International Conference on Acoustics, Speech and Signal Processing, 2022. **[paper]**

[5] **Evmorfos, S.**, Diamantaras, K., Petropulu, A. *"Reinforcement Learning for Motion Policies in Mobile Relaying Networks"*
IEEE Transactions on Signal Processing, 2022. **[paper]**

[6] **Evmorfos, S.**, Diamantaras, K., Petropulu, A. *"Deep Q Learning with Fourier Feature Mapping for Mobile Relay Beamforming Networks"*
IEEE International Workshop on Signal Processing Advances in Wireless Communications, 2021. **[paper]**

[7] **Evmorfos, S.**, Diamantaras, K., Petropulu, A. *"Double Deep Q Learning with Gradient Biasing for Mobile Relay Beamforming Networks"*
IEEE Asilomar Conference on Signals, Systems, and Computers, 2021. **[paper]**

[8] **Evmorfos, S.**, Vlachodimitropoulos, G., Bakalos, N., Gelenbe, E. *"Neural Network Architectures for the Detection of SYN Flood Attacks in IoT Systems"*
ACM International Conference on PErvasive Technologies Related to Assistive Environments. 2020. **[paper]**

[9] Petropulu, A., **Evmorfos, S.** *"Reinforcement Learning for Motion Policies in Mobile Relaying Networks"*
US Patent App. 17/888,411 **[link]**

Honors and Awards

- **Best Student Paper Award** at IEEE International Workshop on Machine Learning for Signal Processing, 2023
- **Gerondelis Foundation Scholarship** for greek PhD students in the US, 2021
- **Papakyriakopoulos Award** for Excellence in undergraduate Mathematics courses, NTUA, 2014
- **The Great Moment of Education Eurobank EFG Scholarship** (fellowship for the highest score in the Nationwide University Entrance Examination among the students of my High School)

Computer Science Skills

- **Deep Learning/Machine Learning frameworks:** PyTorch, scikit-learn, TensorFlow, Keras
- **Programming Languages:** Python, MATLAB, C/C++, Unix Bash, SIMULINK
- **Tools and Platforms:** GNU/Linux, Git

Languages

Greek (*Native*), English (proficient), French (intermediate)