Panagiotis Lymperopoulos

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Education

Tufts University   August 2019 - June 2025
PhD Candidate in Computer Science
MS in Data Science   GPA: 3.90

University of California, Los Angeles (UCLA)   June 2019
Bachelor of Science in Computational and Systems Biology   GPA: 3.42

Relevant Coursework: Deep Learning, Machine Learning for Graph Data, Mathematical Statistics, Natural Language Processing, Algorithms and Complexity, Bioinformatics
Skills: Python, Java, PyTorch, TensorFlow, nltk, AzureML, MLflow

Work Experience

Data Science Intern at Optechain   June 2021 - August 2021
- Implemented ML pipeline for Data Cleaning, Training and Deployment of time-series prediction models on AzureML
- Deployed existing open-source computer-vision models on AzureML for immediate use by end-users.
- Developed infrastructure on the entire stack for querying deployed models, submitting results to database and serving them to end-users.

Research Experience

Novelty Detection in Open Environments, Tufts University   January 2020 - Ongoing
- Developing methods for Novelty Detection on visual and structured data for DARPA's SAIL-ON initiative.
- Integrating novelty detection into planning and reinforcement learning agents to inform exploration and accommodate behavioral adaptation. (See Publications)

COVID-19 Hospital Forecasting, Tufts University   March 2020 - May 2021
- Developed semi-markov forecasting model for patient trajectories.
- Worked with Boston hospitals to assist in predicting ICU and ventilator occupancy. (See Publications)
- Integrated existing epidiomological models and public COVID-19 datasets to produce reliable forecasts.

Concept Wikification for COVID-19, BBN Technologies   June 2020 - November 2020
- Created a wikification dataset tailored for Covid-19 related texts.
- Trained multiple BERT-based transformer models
- Developed end-to-end wikification system for scientific papers related to covid-19. (See Publications)

Medical Image Denoising, Tufts University   November 2019 - December 2020
- Implemented deep-learning based image denoising algorithms. (See Publications)
- Adapted algorithms for use with fluorescent microscopy images.
- Demonstrated potential for transfer learning of denoising models across different tissues and cell types.

Independent and Class Projects

Multi-agent communication learning in the Mrs. Pacman environment   November 2019
- Investigated the emergence of communication in multi-agent systems.
- Demonstrated performance improvement in the Mrs. Pacman environment when agents are allowed to develop a communication protocol.

POMDP for Cybersecurity   November 2019
- Developed a cybersecurity simulation for multi-agent reinforcement learning.
- Investigated the effect of network topology on system vulnerability under RL-based attack and defence strategies.

Graph Neural Networks for Vasular tissue Diagnostics   December 2020
- Developed semi-supervised GNN methods for tumor detection in Angiograms.

Exploring the capabilities of a WGAN discriminator for anomaly detection   March 2018
- Formulated hypothesis that adversarial generative learning also results in anomaly detection capabilities.
- Experimentally demonstrated that early stopping in adversarial training yields a discriminator competent in anomaly detection.

Publications

Lymperopoulos, P., Qiu, H., & Min, B. (2020). Concept wikification for COVID-19. *Proceedings of the 1st Workshop on NLP for COVID-19 (Part 2) at EMNLP 2020*. https://www.aclweb.org/anthology/2020.nlpcovid19-2.29

Brummer, A. B., Lymperopoulos, P., Shen, J., Tekin, E., Bentley, L. P., Buzzard, V., Gray, A., Oliveras, I., Enquist, B. J., & Savage, V. M. (2021). Branching principles of animal and plant networks identified by combining extensive data, machine learning and modelling. *Journal of the Royal Society Interface*, *18*(174), 20200624.

Gopalakrishnan, S., Soni, U., Thai, T., Lymperopoulos, P., Scheutz, M., & Kambhampati, S. (2021). Integrating planning, execution and monitoring in the presence of open world novelties: Case study of an open world monopoly solver. *CoRR*, *abs/2107.04303*. https://arxiv.org/abs/2107.04303

Lee, A. H., Lymperopoulos, P., Cohen, J. T., Wong, J. B., & Hughes, M. C. (2021). Forecasting covid-19 counts at a single hospital: A hierarchical bayesian approach. *Poster in ICLR 2021 Workshop on Machine Learning for Preventing and Combating Pandemics, arXiv preprint arXiv:2104.09327.*

Polleys, C. M., Lymperopoulos, P., Thieu, H.-T., Genega, E., Liu, L., & Georgakoudi, I. (2021). Deep-learning-based image restoration of depth-resolved, label-free, two-photon images for the quantitative morphological and functional characterization of human cervical tissues. *Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XIX*, *11647*, 116470Z.

Feeney, P., Schneider, S., Lymperopoulos, P., Liu, L., Scheutz, M., & Hughes, M. C. (2022). Novelcraft: A dataset for novelty detection and discovery in open worlds. *arXiv preprint arXiv:2206.11736.*

Lymperopoulos, P., Li, Y., & Liu, L. (2022). Exploiting variable correlation with masked modeling for anomaly detection in time series. *Under Review at AISTATS 2023.*