Luca Pantea

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EDUCATION

University of Amsterdam *Sept. 2022 - July 2024*
M.S. in Artificial Intelligence (*Honours*)
Teaching Assistant: Computer Vision 1, Fundamentals of Data Science; *GPA: 8.4/10*

Delft University of Technology *Sept. 2019 - July 2022*
B.S. in Computer Science & Engineering
Thesis: Dynamic User Preferences in Recommendation Systems via Deep Reinforcement Learning; *Grade: 9*

RESEARCH EXPERIENCE

Graph Convolution Networks for Recommendation *June - July 2023*
Extended the LightGCN framework across various datasets and metrics, introducing attention pooling and diffusion propagation for enhanced recommendations and faster convergence. Optimized negative sampling in C++ with pybind11, achieving a **3x speedup** in the sampling process.

Fairness-Enhanced Node Representational Learning *January - February 2023*
Studied and enhanced CrossWalk, introducing *Soft Self-Avoiding CrossWalk*, which yielded significant improvement in fairness and representation. The work was accepted for the 2022 Machine Learning Reproducibility Challenge, published in ReScience C journal and was **awarded a $10,000 research grant from Kaggle** (Notebook).

Enhanced GNNs through Topology and Geometry *April - June 2023*
Developed ToGePi, a Graph Neural Network that merges topological and geometrical information to better analyze and represent data in Quantum Chemistry graphs. The method proved particularly successful in sparse connectivity datasets.

PUBLICATIONS

- Luca Pantea and Andrei Blahovici (2023) '**[Re] CrossWalk: Fairness-enhanced Node Representation Learning**', ReScience C, 9(2), p. 39. doi: 10.5281/zenodo.8173749. Showcased at the Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023 (link).
- Milena Kapralova, Luca Pantea and Andrei Blahovici (2023) '**LightGCN: Evaluated and Enhanced**', New in ML Workshop, Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS), 2023 (link).

WORK EXPERIENCE

Yes!Delft Impact Lab *Feb. - July 2022*
System Integration Engineer (SPOT Mobility Team)
- Developed a Python/OpenCV image processing pipeline for commercial building inspections, **achieving a 30% improvement** in processing times by implementing multi-threading and GPU acceleration.
- Customized and deployed this pipeline on the Boston Dynamics SPOT robot, significantly enhancing real-time data capture capabilities in complex industrial terrains.
- Implemented an iterative alignment algorithm (ICP) to compare LiDAR point clouds and Building Information Models (BIMs), in Python to match LiDAR clouds with BIMs.

Dream Team Epoch *Aug. 2021 - Feb. 2022*
Chief AI Engineer
- Led the team through the AWS Deepracer RL Challenge, and **ranked 10th** out of 300+ participants.
- Implemented an NLP pipeline that streamlined text preprocessing and fine-tuning of RoBERTa and XLNet models, accelerating the model creation and validation cycle.
- Actively helped define the competition strategies and KPIs alongside the other chief engineers.

PricewaterhouseCoopers *April - July 2021*
Software Engineering Intern (Deal Analytics Team)
- Developed a Python Flask + React application to automate matching company names to their respective legal entity names. A **40% speedup** was achieved through the automation.
- Integrated external business APIs and clustering algorithms to create a recommendation system predicting the optimal legal entity name for a given company.

TECHNICAL STRENGTHS

Programming Languages	Python, Scala, Java, Spark, C/C++, Haskell, JavaScript, MATLAB
Libraries & Frameworks	PyTorch (Vanilla, Lightning, Geometric), Tensorflow, JAX, OpenCV, NLTK
Databases	MySQL, PostgreSQL, Neo4j
Tools	Git, Docker, Kubernetes, Colab, SLURM cluster computing