Thomas Magelinski

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Summary of Interests

I am interested in solving problems with complex social data. To do so, I develop new methodologies through network science and graph machine learning approaches, leveraging state of the art techniques in natural language processing. I am particularly interested in how AI is shaping online communities and how we can design new methods to maintain the integrity of the information space, but I am open to pursuing new areas of work in the next phase of my career.

Education

Carnegie Mellon University — Pittsburgh, PA
PhD Computer Science (Societal Computing) — August 2017 - May 2023
Thesis: "Contextualized Conversational Network Dynamics on Social Media"
Committee: Kathleen M. Carley (Chair), Renaud Lambiotte, Patrick Park, and Osman Yagan

Virginia Tech — Blacksburg, VA
Honors Baccalaureate Engineering Science and Mechanics *GPA: 3.9* — August 2013 - May 2017
Minors in Math and Physics

University of Oxford — Oxford, UK
Visiting Student — January 2015 - April 2015

Experience

Spotify Research — New York, NY
Research Scientist Intern — June 2021 - September 2021

- Demonstrated the potential of social signals to improve podcast search and recommendation
- Improved podcast understanding by integrating heterogeneous social network embedding into a transformer-based pipeline using StellarGraph

CASOS Lab — Pittsburgh, PA
Graduate Research Assistant — August 2017 - Present

- Improved unsupervised multi-modal tweet representational learning through *Deep Tweet Informax*, which leverages state of the art multi-lingual natural language processing techniques, the conversational graph, hashtags, and URLs, implemented in PyG
- Developed highly scalable graph algorithms for bot detection and coordinated actor detection on Twitter datasets with tens of millions of Tweets using igraph and PyTorch
- Improved SotA graph classification accuracy by 1-2% on social media datasets by creating and implementing a novel deep graph-convolutional architecture in PyTorch
- Built an interactive dashboard in Plotly to analyze Twitter hashtag network dynamics using diachronic node embeddings
- Designed and implemented a scalable centrality measure which improves the ranking of 1 million PA road intersections by a factor of 8, as measured by ability to fragment the road network
- Uncovered structural change in the Ukrainian Parliament through dynamic community detection
- Published in venues like *AAAI*, *TheWebConf*, *ICWSM*, *The Journal of Online Trust and Safety*, *Applied Network Science*, and *IEEE Transactions on Network Science and Engineering*

Ross Dynamics Lab — Blacksburg, VA
Undergraduate Researcher — November 2015 - May 2017

Awards and Activities

Co-Organizer: Ethics for Technologists Lecture Series — November 2018 - November 2021
Knight Foundation Fellow — Fall 2020, Spring 2021
ARCS Foundation Scholar — August 2017 - August 2020
Outstanding Senior: Engineering Science and Mechanics — May 2017

Technical Skills

Languages and Tools:	Python, R, Java, MATLAB, SQL (MySQL, BigQuery), LaTeX, Git
ML Frameworks and Libraries:	PyTorch, TensorFlow, PyG, StellarGraph, BigGraph, PySpark MLlib
Network Science Libraries:	igraph, NetworkX, Graph-Tool
Data and Statistics Libraries:	PySpark, NumPy, Pandas, SciPy, statsmodels, scikit-learn
Visualization:	Matplotlib, Seaborn, Plotly
Research Areas:	Graph Representation Learning, Node Embedding, Node Classification, Graph Classification, Network Science, Community Detection, Multi-Modal Learning, Natural Language Processing (with graph data)