

SERHAT TADIK

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EDUCATION

Georgia Institute of Technology <i>PhD in Applied Machine Learning</i> School of Electrical & Computer Engineering	Aug 2022 - Present GPA: 4/4
Bogazici University Department of Electrical & Electronics Engineering, Double Major in Physics	Sep 2016 - Feb 2022 Overall GPA: 3.79/4
Washington University in St. Louis <i>Student Exchange Program</i> Attended the Student Exchange Program in the School of Engineering	Jan - June 2020 SPA: 3.94/4

TECHNICAL STRENGTHS

Computer Languages	Python, MATLAB, Julia, SQL, C, C++
Frameworks	PyTorch, PyG, Tensorflow, Streamlit
Tools	SQL Databases, AWS, git, GIS

PUBLICATIONS & REVIEW

Journal

- Augmented RF Propagation Modeling
S. Tadik, M. A. Varner, F. Mitchell, G. D. Durgin
- Digital Spectrum Twins for Enhanced Spectrum Sharing and Other Radio Applications
S. Tadik et al.

Conference

- POWDER-RDZ: Prototyping a Radio Dynamic Zone using the POWDER platform
D. Johnson, D. Maas, **S. Tadik**, A. Orange, L. Stoller, K. Webb, M. B. I. Awan, J. Bills, M. Gomez, A. Sarbhai, G. Durgin, S. Kasera, N. Patwari, D. Schurig, J. Van der Merwe
- G-HCF: Product Recommendation by GNN Based Hybrid Collaborative Filtering
S. Tadik, S. Guzel, K. Cullu, B. Acar

Reviewer

- IEEE Transactions on Cognitive Communications and Networking

EXPERIENCE

Cognosos Inc., USA <i>Research and Development Intern</i>	2024 - Present
<ul style="list-style-type: none">· Working on indoor zone classification using ANN, CNN, and pre-ML techniques such as XGBoost to analyze sources of misclassification. Developed a hierarchical model combining an ANN with a One-vs-One classifier, improving accuracy by 1%.· Implemented various voting algorithms for more stable and accurate predictions, improving accuracy by at least 0.5%.	

- Demonstrated that combining samples at training and inference stages improves accuracy by up to 1.6% by eliminating noise and nulls in signal strength distributions.
- Developed a radio-mapping diagnostics tool to detect outliers, increasing the reliability of data used for training. Led data collection campaigns to analyze tool effectiveness and determine optimal transmitter density for maximum accuracy.

Caretta Software, Turkey

Oct 2021 - Sep 2022

Machine Learning Engineer

- Implemented feature design & engineering, customer segmentation, and churn prediction analysis. Applied clustering algorithms like KMeans and DBSCAN, gaining insights into customer behavior.
- Utilized PyTorch to train an ANN model for churn prediction, recovering 26% of potentially churned customers with targeted promotions.
- Led a project on customer product recommendation using graph neural networks, achieving 90% accuracy in transaction prediction with a GAT model. Work accepted for publication in IEEE Signal Processing and Communications Applications Conference.

The Propagation Group @ Georgia Institute of Technology

Aug 2022 - Present

Graduate Research Assistant

- Developed methods for quantifying and visualizing spectrum occupancy from spectrum monitoring data, introducing new spectrum occupancy visualizations for future allocation and interference analysis.
- Contributed to the implementation of an ambient scatter communications system, employing a complex-valued neural network demodulation technique that surpasses traditional methods.
- Enhanced electromagnetic wave propagation models by applying regularized regression-based error correction, significantly reducing error variance by 58% to 87%.
- Designed digital spectrum twins for radio spectrum usage tracking and prediction, utilizing GIS, OSM, Python, and MATLAB. The models combine received signal strength, variance, duty cycle, and confidence values for various radio users in a region of interest.

Bogazici University, Turkey

Sept 2018 - Jan 2020

Undergraduate Research Assistant

- Completed an undergraduate thesis on "A Comparison Between GNN Architectures and Implementation on Brain Connectomes", demonstrating the superiority of GIN over GCN in graph classification tasks.

RELEVANT COURSES

Advanced Digital Signal Processing
Probabilistic Graphical Models in ML
Pattern Recognition

Convex Optimization
Information Theory
Random Processes and Kalman Filtering

ACHIEVEMENTS

- Graduated with high honors from the Electrical Engineering and Physics Departments at Boğaziçi University.
- Ranked 36th among 2,000,000 candidates in the university entrance exam LYS, in 2016, in Turkey

POSITION OF RESPONSIBILITY

Electrical & Electronics Engineering Department Student Council

Academics

Sept 2018 - 2019

Bogazici University

- Maintained and developed The Scientific Research Encouragement Programme (BATEP)

IEEE Student Club

Member & Executive Board Member and Treasurer

Sept 2017 - Aug 2018

Bogazici University

- Responsible for developing contacts with corporate recruitment teams of several firms for sponsorships regarding three main activities of the student club