Fatih İlhan
Resume

School of Computer Science, College of Computing
Georgia Institute of Technology, Atlanta, GA, USA

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RESEARCH INTERESTS	Efficient AI Systems, Distributed/Federated Learning, Edge-Cloud Computing

ACADEMIC EXPERIENCE

Georgia Institute of Technology   Atlanta, GA, USA

Ph.D. in Computer Science, CGPA: 3.83/4.00, Supervisor: Prof. Ling Liu   August 2021 – Present

- Research focus areas: efficient inference/finetuning, federated learning, large language models, computer vision systems, adversarial machine learning
- Published ten papers (five as first author) in top venues such as CVPR, NeurIPS, WACV, ICDCS.
- Served as reviewer for CVPR, AAAI, ICML, ICDCS, IEEE TOIT.
- Head TA for the Advanced Internet Systems course with 5 TAs and 100-150 students

Bilkent University   Ankara, Türkiye

M.Sc. in EEE, CGPA: 3.58/4.00, Supervisor: Prof. Serdar Kozat   September 2019 – August 2021

- Thesis: Nonstationary Time Series Prediction with Markovian Switching RNNs
- Research focus areas: Nonstationary time series prediction, spatiotemporal event modeling
- Published three papers in top IEEE journals, served as reviewer for IEEE TNNLS, IEEE TSP.
- Served as grader for the Statistical Learning and Data Analytics, and Neural Networks courses.

B.Sc. in EEE, CGPA: 3.81/4.00   January 2018 – June 2019

- Senior Project: GPS-independent outdoor localization system
- Specialization in signal processing, machine learning, communications
- Undergraduate research experience on video anomaly detection under the supervision of Asst. Prof. Hamdi Dibeklioglu and Prof. Serdar Kozat.
- Attended exchange program in Nagoya University, Japan during the Spring 2018 semester and studied intelligent systems for automobiles and traffic management systems.

Ankara Science High School   Ankara, Türkiye

High School Degree, Natural Sciences Field, CGPA: 95.26/100   September 2010 – June 2014

WORK EXPERIENCE

IBM Thomas J. Watson Research Center   Yorktown Heights, NY

Research Intern   May-Aug 2022/2023/2024

- Conducted research on memory-efficient KV caching for long-context inference with LLMs, efficient model pruning and federated learning under resource heterogeneity (Filed one patent application, published three papers at ICDCS23, CVPR23 and CVPR24).

DataBoss Analytics   Ankara, Türkiye

Machine Learning Engineer   August 2018 – July 2021

- Built end-to-end AI pipelines for large-scale online temporal prediction and anomaly detection systems, analyzed complex spatio-temporal traffic, crime and weather data.

Engineering Intern   January 2018 – March 2018

- Implemented models for face detection and panic detection in crowd scenes.

Roketsan   Ankara, Türkiye

Engineering Intern   June 2017 – July 2017

- Wrote a Labview program that enables communication with a GPS receiver and displays/records the position, velocity, heading and time data.
- Worked on integrating GPS and INS using Extended Kalman Filter.

PREPRINTS

[P10] **F. Ilhan**, G. Su and L. Liu, "Memory-Efficient Decoding with KV Cache Compression for Long-Context LLMs", *under review*, 2024.

[P9] **F. Ilhan**, S. F. Tekin, S. Hu, T. Huang and L. Liu, "Fed4LM: Efficient Federated Finetuning under Data and Resource Heterogeneity with a Mixture of Masked Adapters", *under review*, 2024.

[P8] T. Huang, S. Hu, **F. Ilhan**, S. F. Tekin and L. Liu, "Lazy Safety Alignment for Large Language Models against Harmful Fine-tuning", *under review*, 2024.

[P7] T. Huang, S. Hu, **F. Ilhan**, S. F. Tekin, W. Wei, and L. Liu, "Backdoor Defense for Decentralized Learning with Fisher Information Guidance", *under review*, 2024.

[P6] S. F. Tekin, **F. Ilhan**, T. Huang, S. Hu and L. Liu, "LLM-TOPLA: Efficient LLM Ensemble by Maximising Diversity", *under review*, 2024.

[P5] S. F. Tekin, **F. Ilhan**, T. Huang, S. Hu and L. Liu, "FusionShot: Boosting Few Shot Learners with Focal-Diversity Optimized Ensemble Method", *under review*, 2024.

[P4] KH. Chow, **F. Ilhan**, W. Wei, Y. Wu, M. Lee, G. Liu, R. Kompella and L. Liu, "Focal Diversity-Optimized Object Detection Ensembles", *under review*, 2024.

[P3] S. Hu, T. Huang, **F. Ilhan**, S. F. Tekin and L. Liu, "A Survey on Large Language Model-Based Game Agents", *under review*, 2024.

[P2] S. Hu, T. Huang, KH. Chow, **F. Ilhan**, S. F. Tekin and L. Liu, "Linking Ethereum Accounts with Pseudo-supervised Pre-trained Language Models", *under review*, 2024.

[P1] Y. Wu, KH. Chow, S. Hu, **F. Ilhan**, W. Wei and L. Liu, "An Error Diversity Optimization Framework for Creating Efficient Ensemble Learning Systems", *under review*, 2024.

CONFERENCE PAPERS

[C16] **F. Ilhan**, G. Su, S. F. Tekin, T. Huang, S. Hu, and L. Liu, "Resource-Efficient Transformer Pruning for Finetuning of Large Models", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.

[C15] **F. Ilhan**, KH. Chow, S. Hu, T. Huang, S. F. Tekin, W. Wei, Y. Wu, M. Lee, R. Kompella, H. Latapie, G. Liu, L. Liu, "Adaptive Deep Neural Network Inference Optimization with EENet", *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2024.

[C14] KH. Chow, Sihao Hu, Tiansheng Huang, **Fatih Ilhan**, Wenqi Wei, and Ling Liu, "Diversity-driven Privacy Protection Masks Against Unauthorized Face Recognition", *Privacy Enhancing Technologies Symposium (PETS)*, 2024

[C13] **F. Ilhan**, G. Su, Q. Wang and L. Liu, "Scalable Federated Learning with System Heterogeneity", *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2023. *(demo)*

[C12] **F. Ilhan**, G. Su and L. Liu, "ScaleFL: Resource-Adaptive Federated Learning with Heterogeneous Clients", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.

[C11] **F. Ilhan**, S. F. Tekin, S. Hu, T. Huang, KH Chow, L. Liu, "Hierarchical Deep Neural Network Inference for Device-Edge-Cloud Systems", *ACM International World Wide Web Conference (WWW)*, 2023. *(poster)*

[C10] S. Hu, T. Huang, **F. Ilhan**, S. F. Tekin, L. Liu, "Large Language Model-Powered Smart Contract Vulnerability Detection: New Perspectives", *IEEE International Conference on Trust, Privacy and Security in Intelligent Systems, and Applications (IEEE TPS-ISA)*, 2023.

[C9] T. Huang, S. Hu, KH. Chow, **F. Ilhan**, S. F. Tekin and L. Liu, "Lockdown: Backdoor Defense for Federated Learning with Isolated Subspace Training", *Thirty-seventh Conference on Neural Information Processing Systems (NeurIPS)*, 2023.

[C8] W. Wei, L. Liu, KH. Chow, **F. Ilhan** and Y. Wu, "Model Cloaking against Gradient Leakage", *IEEE International Conference on Data Mining (ICDM)*, 2023.

[C7] KH. Chow, L. Liu, W. Wei, **F. Ilhan** and Y. Wu, "STDLens: Securing Federated Learning Against Model Hijacking Attacks", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.

[C6] **F. Ilhan**, S. F. Tekin and B. Aksoy, "Spatio-Temporal Crime Prediction via Temporally Hierarchical Convolutional Neural Networks", *28th IEEE Signal Processing and Communications Applications Conference*, 2020.

[C5] **F. Ilhan**, N. M. Vural and S. S. Kozat, "LSTM-Based Online Learning with Extended Kalman Filter Based Training Algorithm", *28th IEEE Signal Processing and Communications Applications Conference*, 2020.

[C4] **F. Ilhan** and E. Mumcuoglu, "Performance Analysis of Semi-Supervised Learning Methods under Different Missing Label Patterns", *28th IEEE Signal Processing and Communications Applications Conference*, 2020.

[C3] **F. Ilhan**, S. F. Yilmaz and S. S. Kozat, "A Two-Stage Multi-Class Classification Approach Based on Anomaly Detection", *28th IEEE Signal Processing and Communications Applications Conference*, 2020. *(poster)*

[C2] N. M. Vural, B. Altas, **F. Ilhan** and S. S. Kozat, "Shortest Path Learning in Non-Stationary Environments via Online Convex Optimization", *28th IEEE Signal Processing and Communications Applications Conference*, 2020.

[C1] N. M. Vural, B. Altas, **F. Ilhan** and S. S. Kozat, "Online Shortest Path Learning via Convex Optimization", *28th IEEE Signal Processing and Communications Applications Conference*, 2020.

JOURNAL
PAPERS

[J3] **F. Ilhan**, O. Karaahmetoglu, I. Balaban and S. S. Kozat, "Markovian RNN: An Adaptive Time Series Prediction Network with HMM-based Switching for Nonstationary Environments", *IEEE Transactions on Neural Networks and Learning Systems*, 2021.

[J2] N. M. Vural, **F. Ilhan**, S. F. Yilmaz, S. Ergüt and S. S. Kozat, "Achieving Online Regression Performance of LSTMs with Simple RNNs", *IEEE Transactions on Neural Networks and Learning Systems*, 2021.

[J1] **F. Ilhan** and S. S. Kozat, "Modeling of Spatio-Temporal Hawkes Processes with Randomized Kernels", *IEEE Transactions on Signal Processing*, 2020.

AWARDS AND
HONORS

- 191st among 2M high school graduates in University Entrance Examination.
- 80th among 0.2M university graduates in ALES (National GRE).
- Full Scholarship from the Scientific and Technological Research Council of Türkiye for M.Sc. studies.
- JASSO Scholarship for Exchange Program at Nagoya University.
- Full Scholarship from Bilkent University during B.Sc. and M.Sc. Studies.
- Bilkent University High Honor Student during B.Sc. Studies.

SKILLS

Programming: Python, SQL, R, C++, Java, MATLAB, Assembly (8051), VHDL
Tools: Deep Learning Libraries (Tensorflow, PyTorch, Keras), MLOps Tools (Kubernetes, Polyaxon, MLFlow), Other Tools (Docker, Flask, Django, Kafka, Spark), Agile (Gitlab, Atlassian Tools)
Test Scores: TOEFL iBT: 108, GRE: 149/170/3.5
Languages: Turkish (Native), English (Advanced), Japanese (Lower intermediate ~N4)

SOCIAL
ACTIVITIES

- Bass Guitarist in "Parallel Park" (2022-2023)
- Bilkent University Music Club Member (2014-2017)
- Bass Guitarist in "Freud Goes Technical" (2014-2017)
- Bilkent IEEE Student Branch Member (2014-2016)
- Bilkent University Open Software and Internet Technologies Club Member (2014-2015)
- Ankara Science High School Electronics Club Member (2012-2014)
- Ankara Science High School Physics Olympiads Team Member (2010-2012)

HOBBIES

- Backpacking, overnight camping, being on the road
- Playing bass, discovering new music genres