Mahny Barazandehtar

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Education

M.Sc. in Computer Engineering Oct 2025 – Jun 2027
Yeditepe University Istanbul, Turkey

B.Sc. in Computer Science and Engineering Sep 2021 – Jun 2025
Yeditepe University Istanbul, Turkey

Experience

Machine Learning Engineering Intern Jul 2025 – Sep 2025
DHL Supply Chain Istanbul, Turkey

- Developed computer vision systems to enhance workplace safety, focusing on PPE compliance detection (hard hats, safety vests) and ergonomic pose analysis in warehouse environments.
- Trained and evaluated YOLOv8/YOLOv11 models on warehouse CCTV footage to detect PPE compliance with high precision.
- Implemented MediaPipe Pose–based analysis to detect and flag unsafe worker postures in industrial environments.
- Prototyped integration with real-time RTSP camera streams to support large-scale deployment in warehouses.
- Led meetings with senior management to pitch project findings and present proposals for future deployment.

Undergraduate Research Assistant Oct 2023 – Sep 2025
Boğaziçi University Istanbul, Turkey

- Co-authored the manuscript "AI-based investigation of new indices and models for academic quality quantification" (under review at IEEE Transactions on Learning Technologies).
- Assisted in developing the Academic Quality Index (AQI), a novel metric combining traditional bibliometric indicators with new features such as citations-per-paper-per-person (cpppp), maximum first-author citations, and average author position.
- Designed and implemented automated data processing pipelines for retrieving and analyzing large-scale bibliometric datasets ($\sim$296,000 publications, 2,300+ researchers), integrating metrics like h-index, g-index, and i10-index.
- Supported the training and evaluation of machine learning models (Siamese Neural Networks, XGBoost) for academic quality prediction, achieving $\sim$90% accuracy.

Undergraduate Research Assistant Jun 2024 – Oct 2024
Yeditepe University Istanbul, Turkey

- Developed a cloud-based Car Park Management System under the supervision of Professor Tacha Serif, training a YOLO model via Roboflow for license plate detection and integrating it with a Python/Tesseract OCR pipeline to extract plate numbers from cropped images.
- Architected the end-to-end system infrastructure: designed the MySQL database schema and coordinated Arduino devices for real-time image capture and cloud transfer.
- Mentored peers throughout the project.

Publications

- **Mahny Barazandehtar**. *Benchmarking Post-Quantum Cryptography in Federated Learning Under Network Degradation: A Conservation Sensor Network Case Study*. In Proceedings of the 19th International Conference on Information Security and Cryptology (ISC Türkiye 2026), Ankara, Türkiye, pp. [7], IEEE, 2026. doi: https://doi.org/10.1109/(ISCTrkiye)72907.2026.11779208
- Zeynep Karaman, **Mahny Barazandehtar**, Atakan Zeybek, Egemen Ayraç, Şaziye Betül Ozaşteş, Ercan Atam. *AI-Based Investigation of New Indices and Models for Academic Quality Quantification*. Under review at IEEE Transactions on Learning Technologies, 2026.

Selected Projects

Post-Quantum Secure Federated Learning System 2026

- Built a 20-client federated learning system that trains an image classification model (MobileNetV2) on wildlife camera-trap data without centralizing raw data.
- Secured model updates with NIST-standardized post-quantum cryptography (ML-KEM key encapsulation, ML-DSA signatures, AES-256-GCM encryption) and benchmarked it against a classical X25519/Ed25519 baseline.
- Automated a 30-scenario experiment pipeline across 10 emulated network conditions (Linux tc netem), collecting and analyzing 1,200 measurements with confidence intervals and statistical significance testing.
- Published as a sole-author paper in IEEE Xplore and presented at ISC Türkiye 2026.

Storm the Forecast — XGBoost Temperature Forecasting Pipeline 2026

- Built an end-to-end multivariate time series forecasting pipeline using XGBoost to predict air temperature across four horizons (16h to 5 days) from 21 meteorological variables across 36,000 training observations recorded at 10-minute intervals.
- Engineered 166 features including lag features up to 4 days back (motivated by ACF analysis), rolling statistics over 5 window sizes, cyclical sin/cos time encodings, and physically motivated cross-variable interaction terms.
- Implemented a MIMO forecasting strategy using scikit-learn's MultiOutputRegressor, achieving validation MAE of 1.81°C at H=96 and 3.20°C at H=720, confirmed via ablation study against recursive and direct forecasting strategies.
- Conducted horizon-specific hyperparameter tuning via RandomizedSearchCV with a temporally-ordered hold-out split to prevent data leakage.

Deep Reinforcement Learning Agent for the Isolation Game 2026

- Built a custom 7×7 Isolation environment in Python with legal move generation, terminal state detection, and discrete action encoding for move and block placement.
- Designed and trained a dueling DQN with CNN-based state encoding (3×7×7 board tensor); applied Double DQN with target networks, replay buffer, and ε-greedy exploration via self-play.
- Shaped rewards using sparse terminal signals combined with a mobility heuristic to maximize move advantage while constraining the opponent.
- Augmented the learned policy with heuristic playouts for forced-win detection; agent achieved 88% win rate over 1,000 games and was deployed in a Pygame human-vs-AI interface.

SKYN – AI-Powered Dermatological Diagnosis App 2025

- Undergraduate Thesis: Dermatological Disease Detection Using a Mobile-Accessible Cloud-Backed Deep Learning System
- Developed a cross-platform mobile app for early detection of five skin diseases using fine-tuned CNN models trained on a curated dermatology image dataset of 16,549 images, achieving 88%+ accuracy.
- Built full-stack system with FastAPI backend for inference and Firebase for authentication, image storage, diagnosis history, and real-time doctor-patient communication.
- Implemented core features including image upload, prediction with confidence score, diagnosis history, and

role-based access for patients and medical professionals via Flutter UI.

Technologies

Programming Languages: Python, Java, SQL, JavaScript, Bash, MATLAB

Frameworks and Libraries: TensorFlow, XGBoost, Keras, PyTorch, Scikit-learn, liboqs, OpenCV, Pandas, SciPy, NumPy, Matplotlib, FastAPI, Django, MediaPipe, Flutter

Tools: Docker, Git, Linux, Firebase, MySQL, Google Colab, Roboflow, Postman, QGIS, Tesseract OCR, Arduino

Certificates

Machine Learning Specialization (Supervised, Unsupervised, Reinforcement Learning) – Stanford University and DeepLearning.AI

Languages

English: Fluent

Persian: Native Proficiency

Turkish: Professional Working Proficiency

French: Elementary Proficiency