Fatih Emin KARAHAN

Artificial Intelligence Engineer - Computer Vision/Natural Language Processing

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About Me

Hello, I am Fatih Emin Karahan, a Computer Engineering master's student at Bursa Uludağ University. I conduct research in artificial intelligence and develop projects particularly in computer vision, natural language processing, and generative AI. I have built innovative projects on smart agriculture technologies, medical image analysis, and data processing pipelines.

Education

- **Bursa Uludağ University - M.Sc. in Computer Engineering** *2024 - 2026*
  Focus Areas: Computer Vision, Machine Learning, Natural Language Processing, Bioinformatics, Smart Agriculture Systems
- **Bursa Uludağ University - Pedagogical Formation** *2024 - 2025*
  Focus Areas: Introduction to Education, Classroom Management, Guidance, Teaching Principles and Methods, Measurement in Education
- **Bursa Uludağ University - B.Sc. in Computer Engineering** *2019 - 2023*
  Core Skills: Python, Java, SQL, Algorithms, Problem Analysis, Project Management, Presentation

Technical Skills

- **Programming Languages**: Python, Java, Swift, SQL, Arduino IDE
- **Computer Vision**: OpenCV, YOLO (v5-v11), CreateML, EfficientNet, ResNet
- **Natural Language Processing**: Tokenization, AI Agents, RAG (Retrieval-Augmented Generation)
- **Machine Learning**: Scikit-Learn, Classification and Regression Algorithms
- **Deep Learning**: TensorFlow, PyTorch, NumPy, Matplotlib, Pandas
- **Other Tools**: CVAT, Firebase, Flutter, Git, Linux, Arduino, Raspberry Pi, Jetson Nano

Professional Experience

- **SEARCLY [🌐]** *05.2024 - 10.2024*
  Computer Vision - AI Engineer Bursa, Türkiye
  - Built a 500,000+ image dataset using web scraping techniques and prepared 300,000 images for model training
  - Trained and optimized ResNet and EfficientNet models for image classification
  - Trained a YOLOv10 object detection model on a custom dataset and deployed it to production

- **GÖRSENTAM [🌐]** *02.2023 - 05.2023*
  Computer Vision - AI Engineer Intern Bursa, Türkiye
  - Developed a cross-platform mobile application with the Flutter framework
  - Designed a real-time image processing application using a YOLOv5 model
  - Managed image annotation workflows on the CVAT platform and led the data annotation team
  - Collaborated with the company on my undergraduate thesis project

- **VEMUS [🌐]** *10.2022 - 01.2023*
  Mobile Developer Intern Bursa, Türkiye
  - Developed an Android mobile application using Java and Firebase backend services
  - Performed feature development and bug fixing on the company's "HopinLock" smart lock application

Projects

- **An End-to-End Deep Learning Framework for Crop Type and Phenological Stage Identification** *2026*
  Tools: Python, OpenCV, YOLO, Faster R-CNN, RT-DETR-L, PyTorch, Image Processing
  - Developed a 12-class deep learning framework that detects four growth stages (seed, bud, flower, harvestable fruit) of okra, pepper, and eggplant plants
  - Contributed a new labeled dataset to the literature by collecting images from agricultural fields in Muğla and enriching them with open-source data
  - Integrated dynamic Canny edge-density maps to preserve the representation of small seeds and a custom Class-Balanced Focal Loss to address class imbalance
  - Compared YOLO, Faster R-CNN, and RT-DETR-L architectures; achieved mAP@0.5:0.95 = 72.81% and a peak mean IoU = 0.8876 through a five-step ablation study and cross-distribution validation
  - Conducted under the supervision of Assoc. Prof. Gıyasettin ÖZCAN, this work resulted in an academic article published in **IEEE Access** (see Publications)

- **Automatic Detection of Weekly Growth Stages and Slaughter Time in Broiler Chickens with a YOLO-Based Deep Learning Model** *2026*
  Tools: Python, OpenCV, YOLO, PyTorch, Internet of Things Sensors
  - Developed an AI system that automatically detects chickens that have reached slaughter time on poultry farms
  - Managed data collection and model training processes in a real farm environment
  - This work resulted in an academic article published in **ESTUDAM Journal of Informatics** (see Publications)

- **AI-Assisted Dermatology Diagnosis System** *2025*
  Tools: Python, CVAT, OpenCV, YOLO, PyTorch, Transformers, Medical Image Processing
  - Developed an AI model for segmenting the dermis and epidermis layers and atypical cells in skin biopsy images
  - Prepared a dataset using medical data obtained from Bursa Uludağ University Hospital
  - Performed precise annotation of medical images using CVAT
  - Academic publication in preparation together with Assoc. Prof. Gıyasettin ÖZCAN

- **TEKNOFEST Autonomous Tractor Competition** *2024*
  Tools: YOLOv10, Jetson Nano, Basler acA2000-50gm, GPS, Arduino, Socket Programming [GitHub]
  - Developed an image processing system that detects weeds and lettuce plants
  - Designed a GPS-based precise positioning and autonomous navigation algorithm
  - Implemented automatic lane generation and tracking from detected plant rows
  - Optimized real-time image processing on the Jetson Nano

Publications

- **An End-to-End Deep Learning Framework for Crop Type and Phenological Stage Identification** *2026*
  Karahan, F. E., Celikel, T., & Ozcan, G.
  - *IEEE Access*, 14, 97546–97558. doi.org/10.1109/ACCESS.2026.3707086

- **Automatic Detection of Weekly Growth Stages and Slaughter Time in Broiler Chickens with a YOLO-Based Deep Learning Model** *2026*
  Karahan, F. E., & Özcan, G.
  - *ESTUDAM Journal of Informatics*, 1, 31–36. doi.org/10.53608/estudambilisim.1907006

References

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