Burak Ercan

Senior Computer Vision & AI Engineer | Ph.D. in Neuromorphic Event-Based Vision

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Summary

Seasoned computer vision & AI engineer with a Ph.D. in neuromorphic event-based vision and 15+ years of industrial experience at large defense companies and AI startups. Proven track record in designing and implementing AI-driven solutions across diverse sectors, including defense, aviation, robotics, smart cities, transportation, and healthcare.

Experience

Freelance, Senior Computer Vision Engineer & Embedded AI Software Developer
- Specialized in computer vision and embedded AI software development.

Ankara, Türkiye
Jan 2025 – present
1 year

Exin Health AI, Senior Machine Learning Engineer
- Developed algorithms for various computer vision tasks, including classification, object detection, instance segmentation, and temporal action localization.
- Created an end-to-end federated learning pipeline with components for servers, clients, data collection and annotation, performance evaluation, and more.
- Implemented audio processing pipelines including voice activity detection and speech recognition.
- Leveraged large language models (LLMs) to extract information from noisy automatic speech recognition (speech-to-text) outputs.
- Designed complex algorithms and data-flow pipelines seamlessly integrating edge devices, cloud platforms, and local workstations.

Ankara, Türkiye
June 2024 – Jan 2025
8 months

HAVELSAN, Senior Computer Vision Engineer
- Designed and developed computer vision-based scalable video analytic applications for smart cities.
- Researched and developed terrain traversability estimation algorithms using multiple sensor modalities for autonomous ground robots in unstructured outdoor environments.
- Developed 3D surround view systems for automotive applications.
- Researched deep learning based computer vision algorithms for autonomous driving.
- Researched and developed color correction methods for image and video stitching.
- Developed real-time georeferencing solutions using GNS/INS and DEM data for various platforms.
- Gained experience in algebraic multigrid methods for solving large systems of partial differential equations.

Ankara, Türkiye
Apr 2020 – June 2024
4 years 3 months

ArgosAI, Senior Computer Vision Engineer
- Designed, trained, and tested deep learning based neural networks for classification, segmentation, and detection.
- Developed image processing pipelines with classical computer vision techniques for image registration and foreground/background detection using C++, STL, Boost, and OpenCV.
- Wrote Python scripts to create, manage, process, and synthesize large image datasets.
- Wrote Python scripts to automate various tasks such as end-to-end system testing.
- Worked as the product owner of A-FOD, the flagship product of ArgosAI for airfield safety and management.

Ankara, Türkiye
Feb 2019 – Mar 2020
1 year 1 month

ASELSAN, Senior Software Engineer

- Developed software for a wide range of product families, including hand-held thermal cameras, electro-optic sensor systems, and laser warning receiver systems for airborne, naval, and land platforms.
- Led teams of junior software developers and subcontractors by analyzing requirements, decomposing projects into basic tasks, and integrating software components.
- Improved quality and reusability of software by making use of object-oriented design principles, design patterns, modular programming, and unit testing.
- Designed and developed reusable software modules for various hardware architectures including Xilinx Microblaze and Altera Nios II based boards.
- Worked on non-uniformity correction, bad pixel replacement, and image enhancement algorithms for thermal images.
- Managed software through full lifecycle using CMMI Level 3 compliant processes with requirements management, source control, and issue tracking tools.
- Developed graphical user interfaces using Qt, C#, Borland C++, and NI LabWindows.
- Gained hands-on experience on RTOS concepts, file systems, UDP/FTP protocols, MIL-STD-1553, PCIe, RS-422, and RS-485 standards.

Ankara, Türkiye
Dec 2011 – Oct 2018
6 years 11 months

SDT - Space & Defence Technologies, Part Time R&D Engineer

- Implemented an FPGA based SD card controller for recording/playing streaming video, controlled from a graphical user interface.
- Programmed FPGA using VHDL and Xilinx ISE.
- Gained hands-on experience on SPI interface, Secure Digital, and JPEG 2000 standards.

Ankara, Türkiye
Sept 2010 – June 2011
10 months

Education

PhD   Hacettepe University, Computer Science

- Conducted research on event-based vision and deep learning under supervision of Associate Professors Erkut Erdem and Aykut Erdem.
- A member of Hacettepe University Computer Vision Laboratory (HUCVL).
- Completed courses: Computer Vision, Deep Learning, Image Processing, Advanced Computer Vision, Advanced Deep Learning, Optimization, and Text Mining.
- CGPA: 3.97/4.00.
- Thesis: Reconstructing intensity images from events, with publications in IEEE TIP, CVPR Workshops, and ECCV Workshops.
- Previous research interests: person re-identification, visual question answering, visual reasoning, and intuitive physics.

Ankara, Türkiye
Sept 2017 – June 2024

MS   Middle East Technical University, Engineering Management

- Studied data mining and machine learning methods for solving business problems under supervision of Assoc. Prof. Dr. Cem İyigün.
- Devised a method for predicting fixing times of software bugs in Aselsan.

Ankara, Türkiye
2012 – 2015

BS   Middle East Technical University, Electrical and Electronics Engineering

- Specialized in computers area by completing courses on computer architecture, microprocessors, data structures, operating systems, computer networks, digital signal processing, and VLSI design.
- Capstone project: Designed and implemented a robot that pushes goods to designated areas in a warehouse with obstacles using the shortest path.

Ankara, Türkiye
2006 – 2011

Publications

HUE Dataset: High-Resolution Event and Frame Sequences for Low-Light Vision   2024
Burak Ercan, Onur Eker, Aykut Erdem, Erkut Erdem
(European Conference on Computer Vision (ECCV) Workshops)

HyperE2VID: Improving Event-Based Video Reconstruction via Hypernetworks   2024
Burak Ercan, Onur Eker, Canberk Sağlam, Aykut Erdem, Erkut Erdem
(IEEE Transactions on Image Processing)

EVREAL: Towards a Comprehensive Benchmark and Analysis Suite for Event-based   2023
Video Reconstruction
Burak Ercan, Onur Eker, Aykut Erdem, Erkut Erdem
(IEEE/CVF Computer Vision and Pattern Recognition Workshops (CVPRW))

Detection of Traffic Light Violations from Fish Eye Driver Cameras of Public Transport   2023
Buses
Burak Ercan, Mehmet Fatih Özdemir, Onur Eker, Mehmet Can Baytekin, Murat Bal
(31st Signal Processing and Communications Applications Conference (SIU))

A Real-time 3D Surround View Pipeline for Embedded Devices   2022
Onur Eker, **Burak Ercan**, Berkant Bayraktar, Murat Bal
(VISIGRAPP (VISAPP))

Synthetic18K: Learning Better Representations for Person Re-ID and Attribute Recogni-   2021
tion from 1.4 Million Synthetic Images
Onur Can Üner, Cem Aslan, **Burak Ercan**, Tayfun Ateş, Ufuk Çelikcan, Aykut Erdem, Erkut
Erdem
(Signal Processing - Image Communication)

A Study on Calibration Methods for Infrared Focal Plane Array Cameras   2018
Rasim Caner Çalık, Emre Tunalı, **Burak Ercan**, Sinan Öz
(VISIGRAPP (VISAPP))

Skills

Core Technical Skills: Computer Vision, Machine Learning, Deep Learning, Image Processing, Imaging Pipelines, Event-Based Vision, Robotic / Autonomous Vehicles, Embedded Software Design and Development, Real-Time Operating Systems, Electro-Optic Systems, Object-Oriented Design & Programming

Programming Languages: C/C++, Python, MATLAB, C#, VHDL

Libraries & Frameworks: PyTorch, TensorFlow, Keras, NumPy, SciPy, Scikit-learn, OpenCV, ONNX, TensorRT, Triton, ROS, PCL, CUDA, NPP, BOOST, Qt, GStreamer, AmgX, Eigen, AirSim, GDAL, .NET

Achievements

- Ranked 307th in the national university entrance exam among 1.5 million candidates (2006).
- TOEFL iBT Score: 109/120 (Reading: 29/30, Listening: 30/30, Speaking: 23/30, Writing: 27/30).