

Serdar Anıl Demirbaş

Computer Vision Engineer

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SUMMARY

Computer Vision Engineer with 5 years spanning real-time detection and tracking on visible and thermal channels, and professional Unity C#/XR development: the CV + game-engine combination synthetic data pipelines require. Trained YOLOv11m to mAP50 0.904 on a self-built ~15,000-image drone dataset, validated exclusively on real drone footage, and benchmarked it on NVIDIA Jetson Orin NX with TensorRT. Leading a 6-person software team at Atılım UAV (RoboNation SUAS 2026); also building a ball and player tracking prototype (YOLO, ByteTrack) for a sports technology client. Mechatronics BSc, Software Engineering MSc (thesis: adaptive VR in Unity via a biocybernetic loop). Portfolio with a live in-browser detection demo: www.serdaranildemirbas.site

SKILLS

- **CV/ML:** OpenCV, PyTorch, YOLOv11 (Ultralytics), ByteTrack, Supervision, Roboflow, dataset engineering, Albumentations, transfer learning, mAP evaluation
- **Simulation and 3D:** Unity 3D (C#), XR/VR (Oculus), MATLAB 6-DOF simulation, camera calibration and lens distortion modeling, Blender (basic)
- **Deployment/Edge:** model deployment for real-time inference on NVIDIA Jetson, TensorRT, ONNX Runtime, CUDA C, OpenMP, C++ multithreading, ROS 2, Qt, TCP/UDP/UART, Linux
- **Languages:** Python, C++, C# (Unity), MATLAB
- **Tooling:** Git, GitHub Actions, Docker, FFmpeg, Django, PostgreSQL, React/Next.js; AI-native development: spec-driven workflows with Claude Code and Codex CLI

PROFESSIONAL EXPERIENCE

Senior Software Engineer & XR/VR Instructor · Wupsoft Defence & Aerospace

03/2024 – Present · Ankara, Türkiye

- Build interactive Unity 3D scenes and VR/AR mixed-reality applications (Unity C#, Oculus) for defence industry clients, including a showcase demo exhibited at a defence industry trade fair.
- Model 6-DOF external ballistics in MATLAB and render large trajectory datasets as interactive Unity XR visualisations for a TÜBİTAK-funded research project.
- Deliver XR/VR development training: 35 engineers trained to date.

Software Engineer · Digitest Defence and Aerospace Inc.

07/2022 – 03/2024 · Ankara, Türkiye

- Engineered real-time detection and tracking on visible and thermal video channels: C++ detection path and Python tracking path, in a 6-person software team.
- Designed the Qt/C++ operator interface and the live symbol overlay used to monitor detections on live video.
- Parallelised the pipeline with C++ multithreading, CUDA C and OpenMP to sustain real-time throughput on NVIDIA Jetson.
- Wrote the data exchange layer over TCP, UDP and UART.

Part-Time Associate Engineer (started as Long-Term Intern) · Digitest Defence and Aerospace Inc.

07/2021 – 07/2022 · Ankara, Türkiye

- Built the target detection and tracking pipeline on NVIDIA Jetson developer kits; accepted as the capstone project within the university co-op education programme.
- Streamed processed camera video live to a second machine over Ethernet (UDP/TCP).

PROJECTS

RoboNation SUAS 2026 · Atılım UAV · 2025 – Present

- Lead a 6-person software team across detection, mapping, simulation and MAVLink; own the detection and dataset track.
- Built a ~15,000-image class-balanced training set from ~2,100 raw 4K frames: 1280×1280 overlapped tiling, per-class augmentation, hand-annotation in Roboflow; validation kept on real drone imagery only.
- Trained YOLOv11m to mAP50 0.904 / mAP50-95 0.691 under a train-augmented, test-real protocol; benchmarked Jetson Orin NX (tiled 1-3 FPS vs 640 px at 15-20 FPS) to pick the flight configuration.

Sports field video analytics · freelance · ongoing

- Built an end-to-end prototype for a France-based sports technology client: YOLO + ByteTrack ball and player tracking from a single wide-angle camera, goal-area ROI events and automatic FFmpeg highlights (Python, OpenCV, Ultralytics).
- Measured the detector at mAP@0.5 0.80 on an independent test set (player 0.99, ball 0.39), quantifying ball detection as the core challenge.
- Runs at ~1-5 FPS on CPU; output deliberately labelled shot candidate pending a calibrated rig, with Jetson + TensorRT as the real-time target.

Adaptive VR via a biocybernetic loop · MSc thesis · ongoing

- Developing a Unity C# virtual-reality application that measures user stress and adapts the VR scene in real time, closing a biocybernetic loop between the user and the environment.

VR simulation of a multirotor drone · freelance · 2023

- Trade-fair VR simulation for a Netherlands-based client; 2-person team, built in Unity.

Industrial robot playing tic-tac-toe via computer vision · 2021 – 2022

- Second undergraduate capstone; 4-person team, OpenCV board detection and Minimax solver in Python on a FANUC industrial robot.

EDUCATION

MSc Software Engineering (thesis track) · Atılım University, Graduate School of Natural and Applied Sciences
2023 – Present · 100% English-medium, 75% scholarship. Thesis: user stress measurement and adaptive application via a biocybernetic loop in virtual reality, developed in Unity.

BSc Mechatronics Engineering · Atılım University, Faculty of Engineering
2017 – 2022 · 100% English-medium, 75% scholarship. GPA 3.33/4.00, graduated with honours; incl. a one-year English preparatory year.

LANGUAGES & MEMBERSHIPS

Turkish · Native | English · C1 (CEFR: listening C1, reading C1, writing C1, spoken interaction B2, spoken production B2)

Board Member, Chamber of Mechatronics Engineers Ankara Branch (2019-2023) · Chair of the Board, Atılım University Robotics Society (2019-2021)