

Oğuz Gençer | Electronics & AI Engineer | Nanoscience PhD Candidate

Istanbul, Turkey

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Summary

Electrical & Electronics Engineer and Nanoscience PhD Candidate working at the intersection of nanoelectronics and AI. Research focus: biocompatible nanosensors for neural signal recording and the hardware foundations that neuromorphic computing systems require. AI expertise spans two tracks: neuromorphic systems (Intel Loihi 2, SNNs) as the long-term research direction, and applied GenAI (LangChain, LLMs) from Fortune 500 industry experience. Software background is hardware-adjacent throughout – embedded firmware, device drivers, IoT, and industrial automation. 3 peer-reviewed publications. Open-source builder: memex ecosystem (papervault, docvault, podvault). Worked in Turkey, Japan, and Afghanistan.

Technical Skills

Nanoscience: Quantum Dot Synthesis, Nanosensor Fabrication, SEM, TEM, AFM, Raman, XPS, FTIR, Nanoelectronics, TCAD, LTSpice, Photolithography, E-Beam Lithography

Electronics & Embedded: C, C++, VHDL, FPGA, Matlab/Simulink, Altium, KiCad, Firmware Development, Device Drivers

AI & Data Science: Python, TensorFlow/Keras, PyTorch, LangChain, LangFlow, Intel Loihi 2 (SNN), pandas, NumPy, TypeScript/Node.js, ParaView, VTK, HDF5

DevOps: Git/GitHub, Docker, Jenkins, CI/CD Pipelines, SQL, Linux/Shell

Management: Scrum Master (PSM1), Agile/Jira, Team Leadership, Stakeholder Management

Experience

Istanbul Technical University – PhD Candidate

Istanbul, Turkey – Sep 2022 – Present

- Developing a novel noninvasive nanosensor for neural activity recording; fabricating biocompatible nanofiber-based coatings at the neuron-electrode interface to improve signal quality in primary neuron cultures.
- Specializing in neuromorphic computing, nanoelectronics, and AI/data science; using Intel Loihi 2 for SNN experiments and TCAD for device simulation.

BSH Turkey (Bosch-Siemens Home Appliances) – Software Engineer, R&D *Tekirdağ, Turkey – May 2022 – May 2025*

- Formally assigned to a Bavaria Government-funded LLM project with BSH Germany; developed a GenAI system (LangChain) to automate requirement document generation.
- Pioneered an AI Core Team initiative: organized brainstorming sessions, drafted a year-long training curriculum, and prepared AI project proposals for the local R&D team.
- Managed CI/CD pipelines and Agile release deliveries; implemented ambient light feature for embedded firmware.

Sunny Electronics – Software Engineer, R&D

Istanbul, Turkey – Jul 2020 – Jan 2021

- Developed WiFi remote control software for Android TV platforms; managed release and CI/CD pipeline.

Rigel Technology – Software Engineer, R&D

Istanbul, Turkey – Oct 2019 – Mar 2020

- Developed Windows device driver software for VR motion control devices; built a hardware control and testing interface.

Istanbul Technical University, BeeDot Research Group – MSc Researcher

Istanbul, Turkey – Sep 2019 – Jun 2021

- Synthesized Zinc-Doped Carbon-Based Quantum Dots via microwave-assisted methods.
- Characterized using UV-VIS, FTIR, XPS, SEM, and TEM; published in *Diamond and Related Materials* (2022).

Istanbul Technical University, ECC Lab – MSc Researcher

Istanbul, Turkey – Jul 2018 – Mar 2019

- Contributed to design and verification of a novel nanodevice using TCAD and LTSpice; implemented genetic algorithms for parameter optimization. Published at DATE 2019.

Labirent Building Automation – System Engineer & Team Lead

Istanbul, Turkey – Feb 2018 – Jul 2018

- Designed and commissioned turn-key building automation projects (AV, security, meeting rooms); led a team of 8 technicians.

FOTECH – Project Engineer & Team Lead

Istanbul, Turkey / Kabul, Afghanistan – Aug 2016 – Aug 2017

- Led 12-person team delivering fiber-optic, telecom, and security camera infrastructure for the U.S. Embassy in Kabul; coordinated with government authorities and contractors.

Dehenken Limited, AIESEC Internship – Junior Developer

Kyoto, Japan – Sep 2012 – Feb 2013

- Developed IoT/Android demo app (Derimo project); contributed to a Personal Identity Detection system.

Education

Istanbul Technical University

PhD in Nanoscience & Nanoengineering

Thesis: Fabrication and characterization of a biocompatible nanofiber-based coating for the neuron-electrode interface to improve signal quality in primary neuron cultures.

Istanbul, Turkey

Sep 2022 – Present

Istanbul Technical University

M.Sc. in Nanoscience & Nanoengineering

Thesis: Zinc-Doped Carbon-Based Quantum Dot Synthesis & Characterization.

Istanbul, Turkey

Feb 2018 – Jun 2021

Istanbul Aydin University

B.Sc. in Electrical & Electronics Engineering

Graduation Project: Modeling and simulation of the ABB IRB120 6-DOF industrial robot arm using Matlab & Simulink.

Istanbul, Turkey

Feb 2013 – Feb 2015

Eskisehir Osmangazi University

B.Sc. in Electrical & Electronics Engineering

Founded HIDROGU – a hydrogen-powered vehicle research team exploring renewable energy systems.

Eskisehir, Turkey

Sep 2008 – Jul 2012

Istanbul University – Vocational School of Technical Sciences

Associate Degree in Biomedical Device Technology

Istanbul, Turkey

Sep 2005 – Jul 2007

Publications

2022: O. Gençer et al., “Triggering excitation independent fluorescence in zinc(II) incorporated carbon dots,” *Diamond Relat. Mater.*, 123. doi:10.1016/j.diamond.2022.108874

2021: O. Gençer, “Zinc Doped Carbon Based Quantum Dot Synthesis & Characterization” (MSc Thesis), ITU. doi:10.13140/RG.2.2.19652.91526

2019: S. Safaltin et al. (incl. O. Gençer), “Realization of four-terminal switching lattices: Technology development and circuit modeling,” *DATE 2019*. doi:10.23919/DATE.2019.8715123

Selected Projects

memex – Agentic Wiki Template – github.com/drader/memex

Released

Hybrid agentic wiki foundation with BM25 + vector search (RRF). TypeScript, Claude API, MCP. Foundation for papervault (arXiv), docvault (developer docs), and podvault (podcasts).

NeuralLab Assistant

In Development

Hands-free voice assistant for neuron culture labs – eliminates contamination risk by handling note-taking, timers, calculations, and protocol tracking through voice commands only.

ABB IRB120 Robot Arm Simulation – github.com/drader/project-irb120

Released

Full 6-DOF dynamic simulation: DH parameters, Lagrangian dynamics, quintic trajectory generation, PID joint control. Geometry from official ABB CAD files.

Certifications

- PSM1 Scrum Master – Scrum.org (Jun 2023)
- Advanced Hardware Design with Altium – Fedevel Academy (Jan 2022)