Idan Tobis

Beth Hashmonai, Israel · +972-58-633-7098 · idan.tobis@technion.ac.il · linkedin.com/in/idan-tobis-3395b010

RESEARCH INTERESTS

Deep learning theory and practice: activation function design and numerical behavior under low-precision arithmetic; self-supervised representation learning for medical imaging; learned control and reinforcement learning for robotic systems.

I have recently completed a research M.Sc. in computer science and am looking to work full time on research at the intersection of deep learning and clinical imaging, in a research and development role. What draws me is a class of question that takes years rather than product cycles: why some learned representations carry the clinical signal they appear to carry, and why some numerical designs survive conditions that break others. I write my own code, design my own systems, run my own distributed training, and have shipped regulated clinical systems end to end.

EDUCATION

M.Sc. in Computer Science (with thesis) **2026**

Holon Institute of Technology - cumulative average 97.7

Thesis: “ReLog: A Sublinear, Hardware-Efficient Activation Function for Deep Learning”. Grade: 98.

Advisor: Prof. Amir Averbuch (Tel Aviv University). Examiners: Prof. Neta Rabin, Prof. Ben-Zion Bobrovsky.

B.Sc. in Engineering

Technion - Israel Institute of Technology

PUBLICATIONS

- I. Tobis and A. Averbuch. “Precision Engineering an Activation Function”. In preparation for ICLR 2027.

CURRENT AND PAST RESEARCH

- Activation function design under low-precision arithmetic. Continuation of the M.Sc. thesis: which properties of an activation predict whether it survives aggressive quantization. Custom CUDA kernel (native fp32, fp16 bit-simulation); five-experiment protocol with Welch/Holm statistics; distributed training on an NVIDIA B200 cluster.
- Self-supervised representation learning for echocardiography. With Prof. Sara Shimoni (cardiology). Dual-view 3D representation learning across SAX and PLAX, evaluated on aortic valve calcification score prediction.
- Learned control for autonomous landing. Two-agent reinforcement learning with vision-based state estimation for drone landing on a moving platform; evaluated in simulation across platform sizes.
- Cloud removal from optical satellite imagery using SAR. Multimodal learning and domain adaptation for SAR-optical fusion in remote sensing.
- Pose estimation via ray diffusion and pixel-aligned point clouds. Comparative study of multi-view stereo reconstruction with neural representations (Cameras as Rays, DUSt3R).

ACADEMIC APPOINTMENTS

Adjunct Lecturer - Technion, Israel Institute of Technology 2025-present

Continuing Education Programme (TCDS)

Designed and teaches the 6 month long Technion Data Science programme: Python, machine learning, and deep learning.

Senior Teaching Fellow - Sami Shamoon College of Engineering (SCE) 2023-present

Machine Learning for Engineers; Introduction to Artificial Intelligence; Artificial Intelligence for Robotics.

Senior Teaching Fellow - Holon Institute of Technology (HIT) 2021-present

Computer Science: Introduction to Data Science; Machine Learning; Deep Learning; Human-Robot Interactive Software Design; Multimedia Applications in Python.

Mathematics: Deep Learning; Reinforcement Learning. Digital Technologies in Medicine: Introduction to Artificial Intelligence. International School (in English): Introduction to Data Science; Deep Learning; Introduction to Artificial Intelligence.

Adjunct Lecturer - Ben-Gurion University of the Negev 2024-2025

Faculty of External Studies, Data Science

Designed and taught the Deep Learning module for the 6 month data science programme.

STUDENT SUPERVISION

Supervises year-long B.Sc. final projects by outstanding students, in artificial intelligence, neural networks, deep learning and robotics. Selected projects:

- Autonomous drone landing on a moving platform (B.Sc. final project, SCE Ashdod). Co-supervised with Prof. Shlomo Greenberg. Reinforcement learning and computer vision, two-agent architecture, 700 trials across seven platform sizes. Grade: 99; nominated for the Dean's outstanding project award.
- Real-time squat form assessment (B.Sc. final project, SCE Beer Sheva). Sole advisor. Pose landmark extraction with an LSTM classifier, delivered as a full-stack application. Grade: 99; nominated for the Dean's outstanding project award.
- Eleven student pairs mentored on final projects in collaboration with the Museum of the Jewish Soldier in World War II.
- High-school computer science matriculation projects in deep learning, Weizmann Institute mentoring programme. Cumulative project average 98.

PROFESSIONAL SERVICE

- Reviewer, IEEE Internet of Things Journal.
- Mentor, FIRST Robotics Competition; Head Mentor, "Red Pirates" team.
- Teaching assistant, high-school honours mathematics, Shiur Acher NGO.

RESEARCH AND DEVELOPMENT EXPERIENCE

Co-Founder and CTO - Aiode Ltd., Israel 2022-2026

Generative music: LLM-based creative agents, and diffusion models under style conditioning. Work on audio embeddings and interactive agents. Inventor on a pending PCT application, "System and Method for Generating Media".

Senior Computer Vision Algorithm Researcher - Planet Watchers Ltd., Israel 2020-2022

Deep learning for satellite imagery. The recurring problem was that optical data disappears under cloud while SAR remains available but is far harder to interpret, which led to CNN-LSTM change detection and segmentation over seasonal sequences and to multi-sensor fusion with explainable components. Co-inventor on a patent for crop monitoring using Bayesian crop models over seasonal satellite imagery.

Chief Technology Officer - DermaDetect, Israel 2019-2020

Smartphone-image-based dermatological assessment deployed as a clinical service. Led the technology through to acquisition by Maccabi Healthcare Services, which put the system in front of a national HMO patient population rather than a research cohort - image quality, distribution shift and clinician trust as operational problems rather than benchmark ones.

Medical Device R&D - Interventional Cardiology and Structural Heart

R&D roles at SwissVortex (Zurich), Easy-Septal (New Jersey), 4Tech (Ireland) and Apexum (Israel); three acquisitions. The technical thread throughout was navigation and measurement inside a beating heart from poor images - image processing and computer vision on CT, fluoroscopy and ultrasound, under the verification and validation discipline of ISO 13485. This is where my interest in what medical images actually encode began, and it is the direct source of the echocardiography work above.

PATENTS

Inventor or co-inventor on granted and pending patents in medical imaging, structural heart devices, minimally invasive instrumentation and satellite-based agricultural monitoring. Selected:

- US 11,311,699 - Multi-dimensional navigation within a body chamber (with G. Weisz).
- US 11,861,520 - Crop monitoring system and method thereof.
- PCT/IL2026/050266 - System and method for generating media (pending).

Full list available on request.

ADDITIONAL TRAINING

- Advanced Topics in Computer Vision, Weizmann Institute of Science, 2024.
- Deep Learning for Computer Vision, Weizmann Institute of Science, 2023.
- MITx MicroMasters credential in Statistics and Data Science, Massachusetts Institute of Technology, 2021-2023 (online programme). Final average 99.
- English as a Medium of Instruction, Cambridge English Language Assessment.

TECHNICAL

- Deep learning: PyTorch; self-supervised and contrastive learning; diffusion models; CNN-LSTM sequence models; reinforcement learning; LLM-based agents.
- Systems: custom CUDA kernel development (native fp32, fp16 bit-simulation); distributed multi-GPU training on an NVIDIA B200 cluster; containerised cluster workflows.
- Method: experimental design with corrected multiple-comparison statistics (Welch, Holm); ablation protocols; peer review for IEEE Internet of Things Journal.
- Imaging domains: echocardiography, CT, fluoroscopy, intravascular imaging; SAR and optical satellite imagery; computational pathology.
- Clinical and regulated development: ISO 13485 design control, verification and validation, clinical trial support, hospital collaboration.

AWARDS

- First prize, X Challenge Robothon.
- First prize, Untold News Award (USA).
- Presidential Citation for Volunteers.

LANGUAGES

Hebrew (native). English (Cambridge certified; teaches in English).