

FUAD SAFARALIYEV

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RESEARCH INTERESTS

Computer security and privacy from the offensive side: reverse engineering, digital forensics, and applied cryptanalysis, alongside recent work on the robustness of machine learning systems deployed in measurement and health pipelines.

EDUCATION

Zhejiang University · University of Illinois Urbana-Champaign Institute (ZJUI) Aug. 2024 – Jun. 2028 (expected)
B.S. in Electrical and Computer Engineering, dual degree · Junior year in residence at Urbana-Champaign, 2026–2027

- GPA 3.92/4.00 · 60% merit scholarship, awarded for academic performance.
- Coursework: Probability with Engineering Applications (ECE 313), Computer Systems and Programming (ECE 220), Analog Signal Processing (ECE 210); *in progress*: Programming Methods for Machine Learning (ECE 364, PyTorch), Computer Systems Engineering (ECE 391).

RESEARCH EXPERIENCE

NanoVision-EM — Automated Morphological Analysis of SEM Micrographs May 2025 – Present
Undergraduate Researcher, university-funded SRTP · Advisor: Prof. Kemal Celebi, ZJUI

- Built the complete pipeline in Python: contrast-enhancement preprocessing, classical computer-vision pseudo-labeling (Otsu thresholding, adaptive thresholding, watershed), U-Net segmentation, and per-object morphological feature extraction.
- Ran the pipeline across 193 graphene micrographs drawn from 7 experimental batches; an automated quality-control stage retained 177 images and produced 902 per-object morphology records as reproducible tabular output.
- Replaced per-image manual annotation, the throughput bottleneck for routine batch characterization, with a single automated pass over each new batch.
- Identified pseudo-mask supervision as the accuracy ceiling: trained on heuristic masks, the model’s validation IoU of 0.58 measures agreement with those heuristics rather than true accuracy. Building a hand-annotated ground-truth subset for a defensible figure. Manuscript in preparation.

RoboArm — Intelligent Robot Vision and Control Laboratory Apr. 2026 – Present
Undergraduate Researcher, university-funded SRTP · Advisor: Prof. Liangjing Yang, ZJUI

- Developing reinforcement learning algorithms for control of a bio-inspired arm platform, covering reward design, training pipeline, and policy evaluation.

INDUSTRY AND ENTREPRENEURSHIP

NAVA Health Jun. 2025 – Present
Co-founder and Chief Technology Officer · AI health-risk prediction

- Designed and built the backend architecture and output safety system for a live web platform (navarhythm.com) generating individualized health-risk signals from behavioral and biological rhythm data.
- Implemented Dynamic Network Biomarker (DNB) computation for pre-symptomatic transition detection, working from methodology developed by Prof. Chen Luonan’s group at the Chinese Academy of Sciences.
- Gold, Singapore regional round, and Silver, national finals, China International College Students’ Innovation Competition (“Internet+”); product direction validated through 152 structured user interviews and more than 400 early testers.

LeoBank — Bug Bounty Program Jun. 2023 – Aug. 2024
Independent security researcher

- Security testing of the bank’s iOS application under its public bug bounty program: client-side logic, authentication flows, and application configuration.

AWARDS AND DISTINCTIONS

- **Founder and captain, KiberBakmil** — top-ranked CTF team in Azerbaijan for two consecutive years; principal solver for cryptography, reverse engineering, web, and OSINT categories. 1st place, Cyber Army CTF (2024); top 10 internationally, CODEBY platform (2023); 3rd place, national “Cyber Stars” CTF (2023).
- **3rd place, National Informatics Olympiad of Azerbaijan** (2020); selected for the Ministry-funded national training program.
- **Practical Penetration Testing**, certified by the State Service for Special Communication and Information Security of Azerbaijan (2023).

TECHNICAL SKILLS

Security	Reverse engineering, digital forensics, steganography, OSINT, applied cryptanalysis, web exploitation, Linux internals, iOS application security testing
ML / Vision	PyTorch, U-Net semantic segmentation, training under weak and pseudo-label supervision, watershed and Otsu morphological segmentation, OpenCV, scikit-image, NumPy
Languages	Python, C, C++, C#; Git, LaTeX, Linux
Spoken	Azerbaijani, Russian, Lezgian (native); English (fluent); Turkish (intermediate); Mandarin (HSK 3)