

# Saba Machavariani

Tbilisi, Georgia

Email : saba.machavariani@vekua42.edu.ge

LinkedIn — GitHub

## EDUCATION

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- **Tbilisi I. Vekua Physics Mathematical School #42**

## EXPERIENCE

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- **Founder & COO, G-AID:** Engineered autonomous aerial drone system with safety-first navigation, tourist-avoidance, and restricted-zone compliance. Developed landslide risk analysis and landscape-monitoring toolkit using TensorFlow and OpenCV. Featured in Entrepreneur Magazine. (May 2024 - Present)
- **Scientific Cybersecurity Association (SCSA):** Conducted vulnerability detection and penetration testing. Performed Wireshark traffic analysis, OSINT investigations, and structured web penetration testing. Reported credential exposure and proposed security updates. (Mar 2025 - Present)
- **Robotics Mentor, Montessori School:** Mentored students in competitive robotics and AI/ML applications. (Aug 2025 - Present)
- **Competitive Robotics Teacher, Vekua School:** Coached school-wide robotics teams in competitive programming and autonomous systems design. Mentored 80+ students across multiple projects. (Jan 2024 - Present)
- **Team Member, IOAI Team Georgia:** Represented Georgia at the International Olympiad in Artificial Intelligence, competing in AI/ML challenges and research presentations. (May 2025)
- **Team Member, FIRST Global Team Georgia:** Developed ML-powered vision systems using AprilTag pose-estimation with OpenCV and TensorFlow. Led computer vision and autonomous navigation development. Won Katherine Johnson Silver Award for Engineering Documentation. (Jul 2024)

## HONORS & ACHIEVEMENTS

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- **Katherine Johnson Silver Award, FIRST Global Challenge:** Awarded for excellence in robotics engineering documentation and autonomous system design among 190+ nations. (2025)
- **IOAI Participant:** Represented Georgia at the inaugural International Olympiad in Artificial Intelligence. (2025)
- **Silver Medal, FIRST Global Challenge:** Helped innovate first-ever computer vision automation for Georgia's national team (2024)
- **1st Place, STEM National Olympiad:** Secured top position in the national STEM competition. (2023)

## RESEARCH & PUBLICATIONS

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- **Investigating the Geographical Origins of Azurite Dye via Non-Invasive Spectroscopy:** Presented at International Chemistry Tournament 2025 (IChTo). Developed non-invasive spectroscopic techniques using PCA and MATLAB to determine geographical origins of azurite samples for art authentication and historical preservation. (2025)
- **Magnetic Assist:** Researched for International Young Physicists' Tournament (IYPT) 2025. Investigated magnetic field interactions and applications in mechanical assistance systems with focus on energy optimization. Published trajectory dataset on HuggingFace. (2025)
- **Magnetic Music:** Presented at International Young Naturalists' Tournament (IYNT) 2024. Explored acoustic phenomena generated through magnetic field interactions, analyzing frequency patterns using Wolfram and MATLAB. (2024)

## NOTABLE PROJECTS

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- **G-AID - Autonomous Aerial Drone System:** Production-grade autonomous drone with safety-first navigation, landslide risk analysis, and landscape monitoring. Technologies: TensorFlow, OpenCV, Python, Computer Vision.
- **FIRST Global Challenge - ML-Powered Robotics:** AprilTag pose-estimation system using OpenCV and TensorFlow with ROS integration. Trained object-tracking models for autonomous navigation. Katherine Johnson Silver Award recipient.
- **SCSA Security Patches:** Vulnerability detection and penetration testing project. Wireshark traffic analysis, OSINT investigations, and web security assessments. Reported critical security vulnerabilities.

## SKILLS

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- **Programming Languages:** Python, Dart, C/C++, Rust, Go
- **ML/AI Frameworks:** PyTorch, TensorFlow, OpenCV, Hugging Face, Scikit-learn, JAX, LangChain
- **Web & Application Development:** Flask, FastAPI, Django, Flutter
- **MLOps & Deployment:** Docker, Kubernetes, Weights & Biases, Gradio, CUDA, TensorRT, ONNX, MLflow, DVC
- **Data Science Tools:** Pandas, NumPy, Matplotlib, Seaborn, Plotly, MATLAB, Jupyter, SciPy
- **Embedded Systems:** Arduino, Raspberry Pi, PlatformIO, FreeRTOS, ROS
- **Security & Network:** Wireshark, Burp Suite, OSINT, Cisco Networking
- **Cloud & Infrastructure:** Firebase, MuJoCo, Triton, Ray

## LANGUAGES

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- **Georgian:** Native   **English:** Full professional proficiency   **Russian:** Professional working proficiency