Benjamin Kelenyi

Summary

Completed a PhD in Systems Engineering in 2023, with strong interests in software development, artificial intelligence, embedded programming, and microcontroller technology. I have around 10 years of hands-on experience working on diverse engineering and software projects, ranging from embedded systems to real-world AI applications. Passionate about building reliable, efficient, and innovative technologies that solve real-world problems.

Experience

Professional

2022–Present **Senior Software Engineer**, *Qorvo*, Remote.
Project: Custom Ultra-Wideband chip development
Responsibilities:
- HAL development, firmware, AOSP integration
- Zephyr RTOS & Embedded Linux maintenance
- Python tooling, CI/CD automation & feature validation
- Documentation, debugging and system integration

Tools & Technologies: C/C++, Python, Zephyr, AOSP, Linux, Terraform, GitLab CI, GDB, Jira, Confluence

2021–2023 **Artificial Intelligence Researcher**, *Analog Devices*, Remote/Cluj-Napoca.
Project: 3D Vision & Deep Learning using ToF/LiDAR cameras
Responsibilities:
- Developed AI segmentation & 3D classification algorithms
- 3D dataset preprocessing and optimization pipelines
- Embedded deployment of 3D perception algorithms

Tools & Technologies: Python, ROS, OpenCV, NumPy, TensorFlow, Colab, VS Code

2018–2021 **C/C++ Developer**, *Raptor Technologies*, Cluj County.
Projects: Daimler (Infotainment ECU), Faiveley/Wabtec (Train Diagnostic Logging System)
Responsibilities:
- C/C++ development for Linux-based embedded ECUs
- CAN communication integration and debugging
- Train data logging mechanism design and implementation
- Technical documentation and collaboration with engineering teams

Tools & Technologies: C++, Linux, CAN/CANoe, Eclipse, Jira, DOORS

2017–2018 **Junior Software Engineer**, *Fortech*, Cluj County.
Project: Nuance Communications (Speech recognition systems)
Responsibilities:
- Developed and executed automated test scripts for speech recognition components
- Wrote C# test cases to validate NLP and voice interaction features
- Reported defects, performed regression testing, and analyzed system behavior

Tools & Technologies: C#, NUnit, Jira, VS Code

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2017 **QA Trainee**, *Hewlett Packard Enterprise*, Cluj County.
Project: Automated & manual web testing (Selenium, Postman)
Responsibilities:
- Performed manual and automated web application testing
- Created, executed, and documented test cases and bug reports
- Contributed to automated test scripts to improve coverage

Tools & Technologies: Selenium, Postman, NUnit

2017 **C# Summer Intern**, *Emerson*, Cluj County.
Project: Industrial controller simulator development

2016 **Workshop Participant**, *AROBS*, Cluj County.
Project: Microcontroller programming for RGB LED control

Academic

2021–2022 **Teaching Assistant**, *Technical University of Cluj-Napoca*, Cluj-Napoca.
Taught lab sessions for:
- Hydraulic & Pneumatic Systems
- Robotic Control Systems

Tools & Technologies: MATLAB, ROS, Codesys, FestoFluid

Education

2020–2023 **Ph.D. in Systems Engineering**, *Technical University of Cluj-Napoca*, Romania, *3D Object Recognition on Embedded Systems*.
Research on 3D perception and computer vision for embedded mobile robotics using Time-of-Flight (ToF) cameras.

2018–2020 **M.Sc. Applied Computer Science in Complex Systems Engineering**, *Technical University of Cluj-Napoca*, Romania, *Control Systems for Autonomous Vehicles*.

2014–2018 **B.Sc. Automation**, *Technical University of Cluj-Napoca*, Romania, *Automation and Embedded Systems*.

2010–2014 **High School Diploma, Informatics**, *National College "Mihai Eminescu"*, Satu Mare, Romania, *Mathematics & Informatics*.

Technical Skills

Programming	C, C++, Python, Bash, Embedded, Android
Embedded Systems	Zephyr, FreeRTOS, HAL, Device Drivers, Kernel Modules
Platforms	Linux, Yocto (basic), Embedded Linux, AOSP, Android HAL/SDK
AI & 3D Vision	Segmentation, Detection, Point Clouds, ToF/LiDAR, TensorFlow, OpenCV, ROS
DevOps & Tools	Git, GitLab CI, Jenkins, Terraform, Docker, GDB, Eclipse, VS Code, Polyspace, ADB, CANoe
Engineering	OOP, Software Architecture, Unit Testing, Documentation, Agile

Collaborations

- TRAI – Advanced 3D Perception with ToF Cameras (Analog Devices), 2022
- VinEye – Autonomous vineyard mapping robotics (Robotics.AI), 2022
- EPICS – Automated industrial robotics (Bosch), 2021
- InoHubDoc – Human Capital Operational Program, 2020

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Licenses & Certifications

- Active Vision Methods in Autonomous Driving (2022)
- Fundamentals of Applications Security (2018)
- European Computer Driving License (ECDL) (2013)

Honors & Awards

- Team Leader – 3rd Place, Bosch Future Mobility Challenge 2020

Languages

Romanian	Business Fluent
English	Professional Working
Hungarian	Fluent (Native)
German	Basic

Selected Publications

[1] Benjamin Kelenyi and Levente Tamas. Sam-net: Self-attention based feature matching with spatial transformers and knowledge distillation. *Expert Systems With Applications*, 2023.

[2] Victor Domsa, Robert Konievic, Benjamin Kelenyi, and Levente Tamas. Local image feature extraction in the context of automated valet parking based on slam. In *European Control Conference (ECC)*, pages 1–6, 2023.

[3] Benjamin Kelenyi and Levente Tamas. D3gatten: Dense 3d geometric features extraction and pose estimation using self-attention. *IEEE Access*, 11:7947–7958, 2023.

[4] Benjamin Kelenyi, Szilard Molnar, and Levente Tamas. 3d object recognition using time of flight camera with embedded gpu on mobile robots. In *VISIGRAPP*, volume 4, pages 849–856, 2022.

[5] Szilard Molnar, Benjamin Kelenyi, and Levente Tamas. Feature pyramid network based efficient normal estimation and filtering for time-of-flight depth cameras. *Sensors*, 21(6257), 2021.

[6] Szilard Molnar, Benjamin Kelenyi, and Levente Tamas. Tofnest: Efficient normal estimation for time-of-flight depth cameras. In *Proceedings of the IEEE/CVF International Conference on Computer Vision*, pages 1791–1798, 2021.

[7] Marian-Leontin Pop, Szilárd Molnár, Alexandru Pop, Benjamin Kelenyi, Levente Tamas, and Andrei Cozma. Cnn based tof image processing. In *Proceedings of the 20th Python in Science Conference*, pages 148–153, 2021.

[8] Szilard Molnar, Benjamin Kelenyi, and Levente Tamas. Method for estimating normals for cameras with distance and color spectrum information, using neural cnn, 2023. OSIM Patent RO137263A0.

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