ALEXANDER BALGAVÝ, M.SC.

SOFTWARE ENGINEER
SPACE APPLICATIONS SERVICES

alex@balgavy.eu https://alex.balgavy.eu https://github.com/thezeroalpha

PROFILE

I am a Slovak citizen; I grew up in the Czech Republic, and am now working in the Netherlands. I also spent a semester abroad in Boston, USA. I can speak/write Slovak, Czech, and English with native/bilingual proficiency, Spanish with professional working proficiency, Dutch with elementary proficiency, and speak Russian and German with elementary proficiency. I am interested in the fields of software development, cybersecurity, and astrophysics.

EXPERIENCE

SOFTWARE ENGINEER
SPACE APPLICATIONS SERVICES (SEPTEMBER 2023-PRESENT)

- I am designing and developing critical in-flight and ground-based components of a new data management infrastructure for the Columbus module on the International Space Station (ISS). Technologies: Rust, Ansible, Atlassian product suite.

INTERN IN THE LOW EARTH ORBIT EXPLORATION GROUP
EUROPEAN SPACE AGENCY, ISS GROUND SEGMENT SYSTEMS TEAM (MARCH 2023-AUGUST 2023)

- I developed, reviewed, and assessed components of the Columbus Data Management Infrastructure for the ISS, both in-flight and on-ground, such as the primary software responsible for maintaining communication links. Technologies: Rust, Atlassian product suite.
- I led a Rust programming workshop for 17 engineers from different domains (e.g., ISS ground segment, ColKa, IT Infrastructure) and operations managers. Participants came from ESA (ESTEC, European Astronaut Center) and contracting organizations (CGI, Space Applications Services).
- I designed and prototyped a system for open work management, for use by approx. 200 people in the planning of ISS expeditions. I collaborated with mission managers and engineers at the Columbus Control Center in Germany. Technologies: Office 365 (SharePoint, Power Automate, Teams).
- I created software tools to extract, process, and import large amounts of engineering requirements for the operation and development of the Columbus module on the ISS. Technologies: Rust, Python, Atlassian product suite.

TEACHING ASSISTANT
VRIJE UNIVERSITEIT AMSTERDAM (2018-2021)

- Responsibilities included leading exercise classes, preparing for each lesson, assisting during practicals, answering questions via email, and grading assignments/exams. Taught subjects: Operating Systems (in C), Computer Networks (in C++), Computer Programming (in C++), Advanced Programming (in Java), Introduction to Programming (in Python), Web Technology (HTML & CSS, JavaScript, SQL, Python, Go), and Programming for Economists (in Python).

JAVASCRIPT DEVELOPER
MOLTOUR (2018-2021)

- I built, deployed, and maintained a protein data bank viewer used by hundreds of students, with a team of two other developers. I prepared sandboxed workspaces for each lesson based on a configuration provided by the professor. The system was used during lectures and practicals at VU Amsterdam, for courses such as Cellular Biochemistry for the Pharmaceutical Sciences B.Sc. programme, and various courses at Inholland University Amsterdam. The project received the APCA grant in 2020.

JUNIOR MALWARE ANALYST (INTERNSHIP)
ESET (JULY-AUGUST 2020)

- I reverse engineered several kinds of malware using industry-standard tools (IDA Pro, OllyDbg). I wrote detailed reports on the behavior of malware.

PYTHON & WEB DEVELOPER
CLOUD-BASED SOCIAL ROBOTICS (2019)

- I worked on various robotics projects for clients such as the Eye Film Museum, with a team of nine people. I created a Python module to expose an API for the robot's tablet, an HTTP bridge to Apache Kafka and Redis, and a templating web server. I integrated this system with speech recognition and facial recognition modules developed by other members of the team.

EDUCATION

M.SC. COMPUTER SYSTEMS SECURITY
VRIJE UNIVERSITEIT AMSTERDAM & UNIVERSITY OF AMSTERDAM, THE NETHERLANDS (2020-2023)

- I wrote a Master's thesis with VUSec, the university's Systems and Network Security Group. I developed *FirmLine*, a generic pipeline for firmware analysis, and conducted a large-scale analysis of non-Linux firmware, including a security assessment.
- As part of the committee for the development of the curriculum of the Computer Science Bachelor's programme, I guided the future direction of the programme.

HONOURS B.SC. COMPUTER SCIENCE (CUM LAUDE)
VRIJE UNIVERSITEIT AMSTERDAM, THE NETHERLANDS (2017-2020)

- Academics: I graduated Cum Laude and with Honours, earning 218 EC. I wrote a Bachelor's thesis with VUSec, on the topic of the application of formal methods to the development of filesystems. I completed an Honours project with the Distributed Systems Group, creating a characterisation of cloud service failures, and presented it at a research meetup.
- Activities: won first place at the Amsterdam Algorithm Programming Preliminaries contest and finished first from the university at the Benelux Algorithm Programming Contest, qualifying for and competing in the Northwestern Europe Regional Contest.

B.SC. COMPUTER SCIENCE (EXCHANGE)
NORTHEASTERN UNIVERSITY, BOSTON, MA, USA (2019 FALL SEMESTER)

- I completed a semester abroad with a 3.75 GPA, awarded the Dean's List. My studies were supported by the GLOBE Scholarship, which I received as a top-ranking student among hundreds of applicants.

INTERNATIONAL BACCALAUREATE DIPLOMA, ELEMENTARY, MIDDLE & HIGH SCHOOL
INTERNATIONAL SCHOOL OF PRAGUE, CZECH REPUBLIC (2004-2017)

- Honour roll for all four years of high school. Subject honours in Computer Science for both years of the course. Received the International Baccalaureate Diploma with 39 points, on 31 July 2017. Courses include Higher Level Computer Science, Higher Level Physics (Astrophysics option), and Higher Level Mathematics (Statistics option).
- Presented school projects at two Apple Education Leadership Summits, in Prague (2010) and in Geneva (2012). Grade 11 Student Council Representative. Technician (lights, sound) for upper school theater productions, as well as for ISP's first two TEDx Youth conferences (2015, 2016). Programmer and later team leader of the school's Robotics team, winning two awards (Inspire, Control) and competing in the FTC World Championship in St. Louis, USA, in 2016.

OTHER INTERESTS & ACTIVITIES

- **Technology:** I am proficient with Linux server administration (I host my own website and services), and have contributed to open source projects (e.g. Searx, RSS-Bridge, Homebrew).
- **Music:** I play guitar, piano, drums, and violin. I passed the ABRSM examinations with merit, at Grade 7 in piano and Grade 6 in violin. I digitally record, mix, and master songs; I've amassed thousands of views and listens on online platforms. I compose my own music and DJ.
- **Film:** I attended a summer film camp for three years, and my films were selected as the best for two consecutive years. I have an Apple Certification in Final Cut Pro.