MARIUS KILIAN

CURIOUS – COMMUNICATIVE – CREATIVE – CANDID

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PROFILE

My fascination with software engineering originated from a love of problem-solving, performance, and efficiency, and was deepened through the in-depth study of the field during both my undergraduate and graduate degrees. This passion has since evolved into sophisticated personal projects, such as my Spotify playlist sorting platform, and contributing to large-scale full-stack projects at Swisscom, the largest telecommunications company in Switzerland. My academic, professional and personal experience have equipped me with a robust skill set and a relentless drive for innovation. Now, I am eager to embrace a new and exciting challenge where I can further leverage my expertise and passion for software engineering.

EXPERIENCE

SOFTWARE ENGINEER, SWISSCOM; ZURICH, CH – 2021-2022

JAVA – PYTHON – SQL – TYPESCRIPT – ANGULAR – GIT – JENKINS – DOCKER – CLOUD – AWS – AGILE – OOP – TDD

- I was a lead developer in a new team in an agile environment following agile and Scrum methods to successfully create a working MVP prototype in only 6 months of a brand new ML-driven self-help video support service for customers.
- My team garnered the attention of high-profile stakeholders, including the head of all B2C operations at Swisscom, through continuously impressing in monthly cross-team updates.
- As 'Security and Reliability Champion', I was responsible for keeping up to date with standards of these fields, holding regular meetings with other 'Champions' of different teams to discuss developments and relay relevant information.
- Gained experience working in an agile environment, focusing on fast delivery, continuous integration and deployment using tools such as Docker and Jenkins, test-driven development and cloud development with AWS.

RESEARCH AND TEACHING ASSISTANT, KIT; KARLSRUHE, DE – 2017-2020

JAVA – C++ – PYTHON – OPENFOAM – DEALII – OOP

- Conducted research on heat distribution in battery designs, performing simulations with customized Python scripts and analyzing results collaboratively.
- Rapidly acquired proficiency in specialized software such as OpenFOAM and DealII, enabling the handling of advanced tasks under the main researcher's guidance.
- Delivered seminars and tutorials on 'Theoretical Fundamentals of Computer Science' module, instructing fundamental concepts with C++ and Java programming components.

PROJECTS

SPOTIFY PLAYLIST SORTING PLATFORM

JAVASCRIPT – REACT – HTML – CSS – GIT – REST API – SINGLE-PAGE https://github.com/mariuskilian/sortify

- Combined my passion for music and programming, and used the React framework as a new challenge and learning experience, after reading about many of its features and advantages over other frameworks.
- Organized a comprehensive list of features with sketches detailing the user experience, such as single-sign-on using a user's existing Spotify account, and allowing custom playlist manipulation through the different features.

COMPRESSED OCTREE AS A RAY TRACING ACCELERATION STRUCTURE (B.SC. THESIS)

C++ – CMAKE – GIT – PBRT, V3 – PROFILING– INTEL VTUNE https://github.com/mariuskilian/pbrt-v3

- Implemented octree data structure for ray-tracing acceleration in C++, with optimizations such as compression, targeted CPU caching and bit manipulation. Used profiling tools like Intel VTune to analyze code performance, eliminate bottlenecks and optimize algorithm runtimes.

- Developed and applied novel compression techniques to reduce the memory footprint of data structures (for example reducing the octree data structure to a single bit per node), allowing large parts of the structure to be loaded into CPU cache simultaneously, resulting in increased performance.
- Ran experiments comparing my research with state-of-the-art acceleration structures developed by professional teams, analyzing performance, memory footprint and more in various scenes and environments.

LINEAR FUNCTION APPROXIMATION FOR RICH DYNAMIC ACTION SPACES (M.SC. THESIS)

JAVA – TAG – PYTHON – AI – REINFORCEMENT LEARNING – GIT https://github.com/mariuskilian/TabletopGames

- Programmed from scratch a reinforcement learning agent with linear function approximation into the university's tabletop games Java framework (TAG - The Tabletop Games Framework), allowing seamless testing and experimentation with other AI agents on a high variety of tabletop games implemented in the framework.
- Implemented agent initialization through a JSON file describing the settings for the agent, as well as saving current agent settings in a JSON file, if desired, allowing future researchers to use the agent without understanding the implementation details, thus saving valuable time.

AUTO-BATTLER ONLINE MULTIPLAYER GAME IN UNITY

UNITY – C# – PHOTON MULTIPLAYER ENGINE – PHOTON BOLT – HLSL – GIT https://github.com/mariuskilian/Poke-Arena

- Implemented robust game systems with smart and extendable architecture, focusing on simplicity, efficiency, readability and reusability, for example by creating several "Manager" classes for various features (economy, experience, rounds, etc.) that inherit from a general "Manager" interface, ensuring consistency.
- Acquired knowledge in real-time multiplayer net-code, its architecture, conventions and challenges, settling on the Photon Multiplayer Engine for Unity. I implemented net-code with optimistic rendering, allowing instant user feedback while still checking validity of any move on a dedicated server, ensuring security and integrity.
- Programmed custom shaders for several textures using Unity's shader graph feature alongside HLSL, producing high quality visuals and effects for a satisfying user experience.

EDUCATION

QUEEN MARY UNIVERSITY OF LONDON, UK – M.SC. COMPUTER SCIENCE, 2022-2023

C++ – C# – JAVA – PYTHON – OPENGL – GIT – AI – UI/UX

- Graduated with distinction, achieving distinction in every module, including modules on artificial intelligence, computational creativity, UI/UX design, low-level C++ programming and more.
- Led several group projects, distributing tasks between members based on strengths and weaknesses, orchestrating integration between tasks, and always delivering on my own tasks to a high standard.

KARLSRUHE INSTITUTE OF TECHNOLOGY, DE – B.SC. COMPUTER SCIENCE, 2017-2021

JAVA – C – C++ – OS – OOP – HASKELL – PROLOG – ALGORITHMS – DESIGN PATTERNS – DATABASES – GIT

- Achieved second-class honors at this highly competitive and selective member university of the "Excellence Initiative" in Germany, studying modules such as software engineering, databases, algorithms, operating systems, analysis, linear algebra, statistics, and much more.

OTHER SKILLS

LANGUAGES: ENGLISH (FLUENT) – GERMAN (FLUENT) – FRENCH (INTERMEDIATE) – RUSSIAN (BEGINNER)

STANDARDIZED TEST SCORES: GRE: 170/170 QUANTITATIVE; 159/170 VERBAL; 5.5/6 ANALYTICAL

INTERESTS: GUITAR – MUSIC PRODUCTION (SELF-TAUGHT) – READING – SPORTS – CHESS – BOARD GAMES