Péter Szkupien

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Skills

Software Engineering • Algorithms and Data Structures • Database Theory • Model-Based Systems Design • Formal Methods

Programming languages: Java (5 years professional experience), Python, C#, C++, C, SQL, PL/SQL

Technical skills: Linux • Git • Jenkins • Oracle • Spring, EJB, JBoss • Eclipse, EMF, Xtext • JUnit • UML, SysML • LaTeX

Experience

Interactive Brokers **February 2023 – Present**

Software Engineer • Java, Spring, EJB, JBoss, Python, PL/SQL, Oracle *Budapest, Hungary*

- Developing complex, high-performance server-side logic for dividend reconciliation, processing up to 1M+ events per day
- Reduced average processing time by 50% by designing and implementing the partial merge of 15 distributed database-based event queues into a single one, preserving existing distributed locking
- Eliminated manual work by automating internal workflows, saving 100+ work hours per month for operators

Critical Systems Research Group **March 2021 – January 2023**

Research Assistant • Java, JUnit, Gamma, Theta *Budapest, Hungary*

- Enabled observability of non-deterministic decisions of transition systems by implementing a model transformation, splitting transitions into deterministic micro-steps with back-annotation
- Enhanced reliability of an industrial-to-low-level model transformation by creating a test framework and 15 test models, achieving 100% model element coverage

Prolan Process Control Co. **June 2020 – January 2023**

Software Engineer • Java, Eclipse, EMF, Xtext, Xtend *Budakalász, Hungary*

- Automated production of C/Java code and LaTeX documentation by engineering a domain-specific language and code generators for state-machine-based systems, generating 15K+ LoC and reducing manual coding effort by 90%
- Established verifiable model behavior by developing a state machine simulator with Eclipse-plugin-based debugger and 150+ unit tests, achieving 80%+ code coverage

Education

Corvinus University of Budapest **September 2024 – Present**

Information Management Postgraduate Programme *Budapest, Hungary*

Budapest University of Technology and Economics **February 2021 – January 2023**

Master of Science in Computer Science Engineering (Critical Systems major) *Budapest, Hungary*

- Honours degree, GPA: 5.0 / 5.0
- Scientific Students' Association Report (TDK): *Formal Methods for Better Standards: Validating the UML PSSM Standard About State Machine Semantics* (2nd prize)
- Thesis: *Step-By-Step Controllable Simulation of Component-Based Reactive Sys. Based on Precise Formal Semantics*

Budapest University of Technology and Economics **September 2017 – January 2021**

Bachelor of Science in Computer Science Engineering (Systems Engineering major) *Budapest, Hungary*

- Honours degree, GPA: 5.0 / 5.0
- Thesis: *Generating Real-Time Tests from Timed Behavioral Models*

Leadership / Activities

The Cornell, Maryland, Max Planck Pre-Doctoral Research School 2022 **August 2022**

Teaching Assistant at TU Budapest • *C++, C, SysML, SQL* **February 2019 – June 2022**

- Conducted 85+ classes for groups of 20-40 students across various subjects (programming, system modeling, databases)
- Authored and reviewed 30 midterm test exercises, participated in correcting 3,000 tests, held 100 oral exams

Programming Instructor at Szent István Secondary School • *C++, C#* **February 2019 – June 2022**

- Taught programming to 20 students weekly, authored 15 pages of lecture notes in LaTeX
- Mentored beginners to achieve top 20 rankings in the national programming contest (OKTV)

Youth Leader at Children's Railway • *Teamwork, Leadership, Finance* **September 2014 – August 2020**

- At age 15, modernized education by developing a simulator for railway interlocking systems
- Led 600+ children with 60 colleagues through weekly activities, summer camps, and family events (500+ attendees)
- Chaired 3-member committee of the 60-person youth leader community for 3 years, serving as management liaison while overseeing schedules, budgets, workgroups, and training coordinations