Lazar Premović

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Education:

- School of Electrical Engineering, University of Belgrade
  MSc Electrical Engineering and Computing, module Software Engineering (2023 – Present)
  - Scholarship student
  BSc Software Engineering *240ECTS* (2019 – 2023)
  - Scholarship student Average grade 9.96/10
- **Računarska gimnazija** (2015 – 2019)
  - Scholarship student, valedictorian Average grade: 4.96/5

Skills:

- Excellent knowledge of C/C++ and C#
- Knowledge of Python and Java
- Experience with embedded development for ARM and RISC-V based MCUs
- Knowledge of Hardware Description Languages (VHDL, Verilog, System Verilog)
- Experience with digital electronics design, basics of PCB design and practical electronics skills
- Software parallelization using OpenMP, MPI and CUDA
- Working with databases (MySQL, PL/SQL, SQLite), web and Android application development

Relevant experience:

- **Student team BEOAVIA, Electronics and Programming department**
  Junior member (11.2021 – 10.2022), sub-coordinator for Programming (11.2022 – Present)
  - Planned and lead the education of new members and drove the adoption of good engineering practices in internal processes.
  - Designed and developed an in-house motor performance measurement solution based on an STM32 microcontroller.
  - Worked on an aerial target detection and location system that runs on Raspberry Pi and communicates with onboard flight computer.
- **School of Electrical Engineering, University of Belgrade**
  Student Teaching Assistant (10.2021 – Present)
  - Student teaching assistants are selected among the best students to assist with lecturing and examining other students.
- **Microsoft Development Center Serbia**
  R&D Intern in FPGA design and embedded engineering, Mixed Reality (7.2022 – 9.2022)
  - Goal of the internship was upgrading the USB controller firmware used in internal development hardware.
  Research and Development Intern, Azure Data (7.2021 – 9.2021)
  - Goal of the internship was developing a Visual Studio extension to assist in debugging complex applications.

Notable projects:

- RISC-V CPU with external debug support* (BSc Thesis)
  - FPGA implementation of a high performance multicycle RV32I CPU with hardware support for debugging via JTAG. Developed in System Verilog.
- Hardware acceleration of image scaling* (School project, Digital VLSI Systems)
  - Implementation of a hardware accelerator for image scaling and accompanying software, with comparison to software algorithm running on NiosII CPU. Developed in VHDL.
- "Arilla-vlsi" (Team project, Optional school project, Computer Systems for VLSI)
  - Extension of Arilla microcomputer system, adding a PS2 keyboard controller and morse code transceiver. It runs a simple chat program. Developed in Verilog.
- "Arilla" (Team project, Optional school project, Computer Architecture)
  - Microcomputer system consisting of a RISC-V CPU, PS2 mouse controller and a 12-bit RGB SVGA graphics card implemented on FPGA. It runs a simple paint program written in C.
- Affinity aware scheduling for xv6 operating system* (School project, Operating Systems 2)
  - Implementation of two scheduling algorithms (Shortest Job First and Completely Fair Scheduler) with an optional system that takes affinity into account when scheduling.
- Multithreaded environment for MS-DOS operating system (School project, Operating Systems 1)
  - This project implements concepts of threads and semaphores on top of MS-DOS operating system, allowing it to execute multiple programs concurrently. Developed C++.
- Assembler, linker and emulator for fictional CPU architecture (School project, System Software)
  - Implementation of a single pass assembler, linker with support for relocatable object files and emulator with virtual terminal and timer. Developed in C++.
- CPU and GPU parallelization of multiple algorithms* (School project, Multiprocessor Systems)
  - Implementation and comparison of OpenMP, MPI and CUDA parallelization of three HPC workloads. Developed in C.
- Compiler of a simple Java-like language (School project, Compiler Construction 1)
  - Implementation of a compiler for an object-oriented language which supports inheritance and virtual functions, compiling to Java-like bytecode. Implemented in Java.
- Man-machine interface for application in music* (Graduation Thesis)
  - Goal of the thesis was constructing a control surface similar to those of audio mixers and video switchers and developing software that allows full customization of each control. It is powered by an Arduino MCU and C# desktop software.

Other projects:

- Architecture aware software optimization and cache and branch prediction simulation: Optimizing a piece of software using intrinsic instructions and cache layout and simulating multiple cache replacement and branch prediction algorithms.
- PCIw*: Specification and reference implementation of a bus for communication between CPU and peripheral devices in a computer system.
- Simple CPU design in Logisim: Multicycle implementation of a one address CISC CPU.
- FPGAception: Rudimentary FPGA chip designed using VHDL.
- MUVC: Library that abstracts the Client-Server model using interface similar to that of a Console class, written in C#.
- Groove: Rudimentary Digital Audio Workstation (DAW) with support for multiple MIDI or live audio tracks, instruments and effects. Written in C# using NAudio and ASIO audio driver.
- Collection of other projects

Additional experience and competitions:

2023.

- Guest associate at Science and Engineering Center „PFE" winter camp.
- Gave a lecture "How do we find errors in programs?" at the 8th Computer Science Week held in the Mathematical Grammar School.

2022.

- Award for best 3rd year software engineering students.

2021.

- Lecturer of introductory C# and Python courses for CET computer school from 2019 to 2021.

2019.

- 3rd prize at the national informatics competition organized by Društvo Matematičara Srbije (A category) and participation in the Serbian Informatics Olympiad.

2018.

- 1st place at the national robotics competition „Eurobot Srbija 2018" in junior category as a part of a two-member team and participation in the European robotics contest „Eurobot Junior 2018" held in Paris.
- 2nd place at the qualifications for the WER robotics competition as a part of a two-member team.

2017.

- Internship at the research and development institute RT-RK from 03.07.2017. to 31.07.2017. Details and the letter of recommendation can be found here*.
- 2nd place at the MATHackathon, a team competition which gave contestants six hours to develop hardware and software on a given theme (theme was „Smart home component", software part of the project can be found here).
- 1st prize in the mts app competition, with the Android app WalkieTalkie, as a part of a team.

Professional interests:

- Computer architecture and organization, especially RISC-V
- System software
- Real time systems
- Embedded systems, especially for audio-video production and theatrical lighting
- Measurement and test equipment

Other:

- Attendee of the Computer Science Week in 2017, 2018, and 2019 in the Mathematical Grammar School.
- Technical organizer of the e-sports competition PlayIT in 2018. and 2019.
- Audio-video tech internship at Fortuna esports in 2019.
  CV related to audio-video production
- Proficient in English.

* Available in Serbian only