Ing. Martin Domarackỳ

Senior Software Engineer

Košice, Slovakia

Over the years, I have worked on a variety of projects, including hardware orchestration, data collection and display, and SQL database applications for biomedical research. I have experience developing robust applications from backend to frontend in highly parallelized, multi-event environments. Each of my projects has been engineered with unit, integration, and end-to-end tests, all integrated into a CI/CD pipeline.

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Work Experience

Sept 2023 - July 2024

Senior Software Engineer (via Nexer)

Exscientia

- Worked on an API providing access to a big data database powered by PostgreSQL
- Integrated unit, integration, and end-to-end tests into the CI/CD pipeline
- Utilized AWS infrastructure and related technologies

July 2023 - July 2024

Senior Software Engineer

Nexer group

- Part of the Czech-Slovak branch of the Nexer team
- Senior Python developer

Nov 2022 - Now

Senior Software Engineer (Freelancer)

The research Team of Dr. Saša Bajt

- Developed control software for a high-precision sputtering machine
- Created a testing environment for various virtual devices using the Kamzik3 control framework
- Provided support and guidance for experiments involving X-ray microscopy

May 2022 - Nov 2022

Senior Software Engineer

Blockmate.io

- Developed a REST-based API for a client web portal
- Implemented the NFT component of the product API
- Integrated various cryptocurrencies into the final API product
- Utilized multiple endpoints, including Rarible, Quicknode, and Moralis
- Employed technologies such as AWS, Docker, Cassandra, and FastAPI

Jul 2015 - Dec 2021

Senior Software Engineer

Center for Free-Electron Laser Science

- Developed a modular and lightweight experiment control framework (Kamzik3) in Python3 and PyQt5
- Authored control software for multiple experiments conducted worldwide (LCLS, Sacla, XFEL, ESRF, etc.)
- Created a software stack for assembling Multilayer Laue Lenses, covering the entire pipeline from recipe preparation to data evaluation
- Developed control systems for a tabletop beamline using the Sigray X-Ray source
- Provided tools to automate experiment logbooks using Confluence and Rocketchat APIs
- Authored a Python and MySQL-based database tool essential for COVID-19 virus screening in a group of approximately 70 people
- Delivered software for various laboratory setups
- Actively participated in experiments, offering on-site support

Jul 2014 - Jul 2015

Software Engineer

Deutsches Elektronen-Synchrotron

- Developed hardware controls using Python 2 and Tango, along with GUI (PyQt4), for beamline P02.1
- Automated the data collection pipeline
- Collaborated extensively with physicists and instrument users

Sep 2009 - Jun 2014

Web Developer

University of Pavol Jozef Safarik in Kosice

- Developed the Portal of Virtual Collaboration, facilitating connections among individuals within the Slovak academia
- Collaborated with CALTECH on integrating the video conferencing system SeeVogh into the Slovak academic domain
- Created an archiving and streaming platform for the SeeVogh video conferencing system in collaboration with the Technical University in Košice

Education

The Technical University of Košice

Sep 2009 - May 2011

Informatics - Engineering degree

The Technical University of Košice

Sep 2006 - Jun 2009

Informatics - Bachelor's degree

Strong level skills

Python3 MySQL PostgreSQL PyQtGraph PyQt5 PyQt6 PySide6 Pydantic TOML ZMQ PySerial Threading Multiprocessing HW APIs GraphQL Pytest

Intermediate level skills

Numpy Pandas HTML CSS tkinter Bash RegExp asyncio Tango controls Google API YAML Docker FastAPI SQLAlchemy Docker RabbitMQ Celery OpenCV Matplotlib DAPR Web3

Basic level skills

C C++ C# PyTorch Keras TensorFlow CUDA Cassandra AWS Django

Languages

English — Fluent

Slovak — Native or Bilingual

Czech — Fluent

German — Beginner

Japanese — Beginner

References

Vackar Afzal - Director, Platform Integration @ Exscientia

> Martin's efficiency in working through tickets was also noted. He consistently managed to work through a significant number of tickets, without compromising on quality. All work was completed to a very high standard. His solutions were not only effective but also elegantly designed, ensuring long-term maintainability and scalability.

2024-06-18 vafzal@exscientia.co.uk Reference letter

Prof. Dr. Dr. H. C. Henry Chapman FRS - Division Director @ CFEL

> Mr Domaracky impressed us with his comprehensive, wide-ranging and in-depth specialist knowledge, which he was always able to apply confidently and in a target- oriented manner in practice. Very recommendable is his very strong knowledge of the python programming language as well as his high level of expertise in developing software to control physical systems, including motors, sensors, large-area detectors and cameras, and interferometers.

2021-12-31 henry.chapman@cfel.de Reference letter

Steve Aplin - Head of Data Department @ XFEL

> Martin is a very skilled engineer, who has a talent for developing a clear and insightful understanding of the problem he is trying to solve. He has chosen to take a path without bosses and go freelance, a decision given his determination and creativity I can fully understand, and one which I strongly believe he will succeed in.

2021-10-07 steve.aplin@xfel.eu Reference letter

Dr. Luca Gelisio - Head of Data Analysis @ XFEL

> Martin is definitely the most professional person I ever met. He always met deadlines, even when time was clearly not enough. He did so because he felt the responsibility: his software has been – and will be – the key for the success of hundreds of experiments and the production of the most advanced MLLs ever produced.

2021-09-06 luca.gelisio@xfel.eu Reference letter

Publications

1. New aerodynamic lens injector for single particle diffractive imaging
   2023-10-04 | Nuclear instruments & methods in physics research / Section A

2. Rapid and efficient room temperature serial synchrotron crystallography using the CFEL TapeDrive
   2022-10-31 | IUCrJ

3. Robust Ptychographic X-ray Speckle Tracking with Multilayer Laue lenses
   2022-06-29 | Optics express

4. On the use of multilayer Laue lenses with X-ray Free Electron Lasers
   2022-03-22 | arXiv

5. X-ray screening identifies active site and allosteric inhibitors of SARS-CoV-2 main protease
   2021-05-06 | Science

6. Scanning Compton X-ray microscopy
   2021-04-14 | Optic letters

7. Ptychographic X-ray speckle tracking with multi-layer Laue lens systems
   2020-07-12 | Journal of applied crystallography

8. Evaluation of serial crystallographic structure determination within megahertz pulse trains
   2019-12-04 | Structural Dynamics

9. Megahertz serial crystallography
   2018-11-01 | Nature Communication

10. X-ray focusing with efficient high-NA multilayer Laue lenses
    2017-11-26 | Light: Science & Applications

11. Simple convergent-nozzle aerosol injector for single-particle diffractive imaging with X-ray free-electron lasers
    2015-03-31 | Structural Dynamics