Tornike Onoprishvili

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Education

Free University of Tbilisi — Tbilisi, Georgia
Bachelor of Engineering, Electrical Engineering — *Aug 2015 — May 2019*

Lappeenranta-Lahti University of Technology — Lappeenranta, Finland
Master of Science, Data-centric Engineering — *Aug 2023 — Present*

Università della Svizzera italiana — Lugano, Switzerland
Master of Science, Data Science — *Aug 2024 — Present*

Work Experience

Machine Learning Consultant — Apr 2024 — Present
Pangea Bio — *Remote*
- Created SimMS: A GPU-Accelerated Cosine Similarity implementation for Tandem Mass Spectrometry [1].
- Designed SpectruMS: A cost-effective MS/MS foundation model learning the language of mass spectrometry.

Machine Learning Consultant — Jun 2022 — Present
Scalexa — *Remote*
- Designed a cost-efficient AI-inference pipeline for VIMAGE, on Google Vertex AI.
- Developed computer-vision software for automatic nano-structure assembly in Python.

Research Assistant — Jun 2017 — Aug 2020
Free University of Tbilisi — *Tbilisi, Georgia*
- Developed FDTD simulation software for optical nonlinear photonic crystals in MatLab [2].
- Developed software for optical logical gate simulations in MatLab [3].

Projects

Author, SpectruMS — Nov 2024 — Present
- Design AWS Lambda ETL pipeline for processing entire GNPS
- Design SpectruMS sequence-to-sequence pretraining and fine-tuning approach
- Set up TPU training with Flax, HuggingFace and Transformers on Google Cloud

Author, SimMS (github.com/PangeAI/SimMS) — Jun 2024 — Present
- Extend supported mass spectra similarity methods
- Maintain and support online SimMS GUI

Contributor, MatchMS (github.com/matchms/matchms/) — Jun 2024 — Present
- Performance optimization, profiling and user support.

Competitions

Neural Wave — Nov 2024
- Participated in Neural Wave hackathon in Lugano, Switzerland.
- Won 1st place (prize CHF 600) for developing a RAG customer support bot (code and demo)

Skills

- **Programming Languages**: Python, CUDA C++, Bash
- **Technologies**: Git, UNIX, Docker, Google Cloud Platform, AWS, Slurm
- **Python Libraries**: PyTorch, Flax, Pandas, HuggingFace Ecosystem, NUMBA, CuPy

Bibliography

[1] T. Onoprishvili *et al.*, "SimMS: A GPU-Accelerated Cosine Similarity implementation for Tandem Mass Spectrometry," *bioRxiv*, 2024, doi: 10.1101/2024.07.24.605006.

[2] V. Jandieri, R. Khomeriki, T. Onoprishvili, D. H. Werner, J. Berakdar, and D. Erni, "Functional all-optical logic gates for true time-domain signal processing in nonlinear photonic crystal waveguides," *Opt. Express*, vol. 28, no. 12, pp. 18317–18331, Jun. 2020, doi: 10.1364/OE.395015.

[3] V. Jandieri, T. Onoprishvili, R. Khomeriki, D. Erni, and J. Pistora, "Digital signal processing in coupled photonic crystal waveguides and its application to an all-optical AND logic gate," *Optical and Quantum Electronics*, vol. 51, no. 4, p. 121, Apr. 2019.