Dmytro Perekrestenko

Experience

Since 2022   **Software Engineer**, *Google DeepMind*, Zürich, Switzerland.
Since 2024 - Gemini Post-training.
Before 2024 - Google Assistant team. Migrated legacy Assistant C++ infra to Dart, positively impacting over 100k users. Developed usage metrics monitoring, alerting systems, and a leadership reporting dashboard. Conducted in-depth metrics analysis, debugging infrastructure customization, and Gemini evaluations.
Tech stack: Python, Dart, C++, GoogleSQL, Angular, TypeScript.

2021 – 2022   **Research Software Engineer**, *Ablacon SA*, Zürich, Switzerland.
Developed an AI-based diagnosis system that enabled doctors to cure Atrial Fibrillation.
Tech stack: Python, Numpy, Scipy, Scikit-learn, Pandas, Tensorflow, Gitlab.

2015 – 2016   **Data Science Intern**, *ABB Corporate Research*, Baden, Switzerland.
Prediction of web visitor behavior and assessment of web page usability.
Tech stack: Python, Spark, SQL, and Google BigQuery.

Skills

Programming   Python, SQL, MATLAB, C/C++

Frameworks   Tensorflow, PyTorch, Scikit-learn, Google BigQuery

Knowledge   machine learning, deep learning, statistics, natural language understanding, time-series analysis, optimization, audio/image processing

Languages   Ukrainian - native, English and Russian - fluent, German - B2, French - B1

Education

2016 – 2021   **Dr.sc.**, *Eidgenössische Technische Hochschule Zürich (ETH Zurich)*, Switzerland.
Specialization - Machine Learning/Deep Neural Network Theory

Selected Coursework: *Natural Language Understanding, Entrepreneurial Leadership*

2014 – 2016   **M.sc. in Electrical Engineering and Information Technology**, *École Polytechnique Fédérale de Lausanne (EPFL)*, Switzerland, *GPA: 5.57/6.0*.
Specialization - Information Technology/Signal Processing

Selected Coursework: *Applied Machine Learning, Mathematics of Data, Image and Video Processing, Speech Processing*

2010 – 2014   **B.sc. with honors in Applied Mathematics and Physics**, *Moscow Institute of Physics and Technology (MIPT)*, Russia, *GPA: 4.84/5.0*.
Specialization - Statistics/Data Analysis

Selected Coursework: *Algorithms and Data Structures, Statistics, Optimization*

Selected Projects

Convolutional recurrent neural networks for electrocardiogram classification.
Proposed two deep neural network architectures for classification of arbitrary-length
electrocardiogram (ECG) recordings and achieved top accuracy on the atrial fibrilla-
tion (AF) classification data set provided by the PhysioNet/CinC Challenge 2017.
Published and presented at Computing in Cardiology 2017.

Deep neural network approximation theory. Proved that deep neural networks
are optimal approximators for affine and Gabor function systems. Presented at
GAMM 2019.

Constructive universal distribution generation through deep ReLU networks.
Proved that deep generative networks with 1D input are capable to optimally
approximate high dimensional distributions. Presented at ICML 2020.

Faster optimization through adaptive importance sampling. Introduced new
adaptive rules for coordinate descent methods and derived theoretical convergence
guarantees for Lasso and SVM. Master thesis. Presented at AISTATS 2017.

Human activity recognizer. Used the smartphone's accelerometer time series and
neural networks to classify human activities such as walking, running, standing, etc.
Presented at 56th Scientific Conference at MIPT.

Other

Scholarship | In 2010 – 2013 received MIPT scholarship given to the top 10% of students
Coursera | Functional Programming Principles in Scala, Big Data Analysis with Scala and Spark
Hobbies | Skiing, competitive swimming, sci-fi literature, aikido, solving riddles

Selected Publications

[1] Dmytro Perekrestenko, Léandre Eberhard, and Helmut Bölcskei. High-dimensional
distribution generation through deep neural networks. *Partial Differential Equations
and Applications, Springer*, 2(64), September 2021.

[2] Dennis Elbrächter, Dmytro Perekrestenko, Philipp Grohs, and Helmut Bölcskei. Deep
neural network approximation theory. *IEEE Transactions on Information Theory*,
67(5):2581–2623, February 2021.

[3] Dmytro Perekrestenko, Stephan Müller, and Helmut Bölcskei. Constructive uni-
versal high-dimensional distribution generation through deep ReLU networks. In
Proceedings of the 37th International Conference on Machine Learning (ICML),
volume 119, pages 7610–7619. PMLR, July 2020.

[4] Martin Zihlmann, Dmytro Perekrestenko, and Michael Tschannen. Convolutional
recurrent neural networks for electrocardiogram classification. In *Computing in
Cardiology (CinC)*, pages 1–4, September 2017.

[5] Dmytro Perekrestenko, Volkan Cevher, and Martin Jaggi. Faster Coordinate De-
scent via Adaptive Importance Sampling. In *Proceedings of the 20th International
Conference on Artificial Intelligence and Statistics (AISTATS)*, volume 54, pages
869–877. PMLR, April 2017.