Mikhail Tsukerman

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Work experience

- **Scientific Researcher**, ITMO University, School of Physics and Engineering Feb. 2024 – Now
  - Designed neural network architectures for complex data analysis tasks (**PyTorch, NumPy, Matplotlib**).
  - Developed optimization algorithms for multi-objective problems (**SciPy, Evolutionary algorithms**).
  - Created Python modules for large-scale data simulations (**Python packaging, OOP**).

  Main outcome: Reduced the training time with designed neural network **from 15+ hours to ∼6 hours**; developed **2000 LoC** Python package for electromagnetic modeling and parametrizations.
- **Machine Learning Intern**, Tel Aviv University, School of ECE June 2025 – August 2025
  - Developed conditional diffusion models for solving inverse design problems (**PyTorch, FiLM layers**).
  - Conducted statistical evaluation for generative model assessment (**Pandas, NumPy, SciPy**).

  Main outcome: Designed diffusion neural network with generation **MPE loss 1.39%.**
- **Computer Vision Intern**, ITMO University, Laboratory of Technical Vision Feb. 2025 – March 2025
  - Preprocessed and augmented large-scale dataset of conveyer images (**Python, OpenCV**).
  - Applied computer vision models for object detection and classification (**Tensorflow, YOLO, ResNet**).

  Main outcome: Implemented YOLO architecture neural network with **Precision = 0.98** and "**mAP 50**" **= 0.99**.

Scientific Projects

- **Conditional Diffusion Model for Inverse Design**, [paper link] Jan. 2025 – Now
  - Paper was accepted to **NeurIPS 2025 ML4PS Workshop**.
  - Designed conditional diffusion neural network for inverse design problems (**PyTorch, FiLM**).
  - Applied evaluation metrics to quantify model performance and ensure robustness, (**Pandas, NumPy**).
- **Deep Learning methods for robot clusters behavior analysis** May 2025 – Now
  - Implemented clustering algorithms for sensor data analysis (**Scikit-learn**).
  - Developed deep learning contrastive loss models for object clusterization task (**PyTorch**).
  - Processed and augmented visual datasets using OpenCV and custom pipelines.
- **Evolutionary Algorithm for Scattering Control**, [paper link] Dec. 2023 – Jan. 2025
  - Built evolutionary optimization pipeline for parameter tuning (**Python**).
  - Conducted large-scale computational experiments with simulation data (**Pandas, Scikit-Learn**).
  - Summarized results in scientific publications and presentations (**LaTeX, Matplotlib, Seaborn**).

Qualifications and Skills

- **Programming:** Python (Pandas, NumPy, SciPy, Numba), Docker, SQL, UV, Git.
- **ML/AI:** PyTorch, Scikit-learn, CatBoost, XGBoost, OpenCV, CVAT.
- **Visualization:** Matplotlib, Seaborn, Inkscape, LaTeX.
- **Languages:** English (TOEFL 102/120, Aug. 2025), German (DSD B2 Level, May 2022).

Education

- **ITMO University**, BS in Applied and Theoretical Physics, GPA: 4.7 (out of 5.0) Sept. 2022 – Now
  - **Computer Science:** Machine Learning and DL, Optimization Methods, Probabilistic Graphical Models.
  - **Mathematics:** Calculus, Statistics, Linear Algebra, Theory of Complex Functions, Differential Equations.
  - **Physics:** Numerical Methods, Quantum Mechanics, Statistical Mechanics.

Conferences

- **Metamaterials 2025 Conference**, Amsterdam, Netherlands September 2025
  - Oral Talk, "Adaptive Metasurface for Complex Inverse-design Scattering Control".
- **Lomonosov 2025 Conference**, Moscow State University – Moscow, Russia April 2025
  - Oral Talk, "Application of a stochastic optimization algorithm to an inverse scattering problem".
- **Metamaterials 2024 Conference**, Crete, Greece September 2024
  - Oral Talk, "Genetic Surfaces for Scattering Suppression".

Honors and Awards

- **Best Oral Talk**, Lomonosov 2025 conference, Moscow State University April 2025
- **Best internship project**, Laboratory of Technical Vision, ITMO University April 2025
- **Fellowship for Outstanding International Students**, Tel Aviv University March 2025
- **Best Presentation**, Congress of Young Scientists, ITMO University April 2024