Nikolay Malkovsky

Curriculum Vitae

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Work Experience

2021-2022 — **Sr. Researcher**, TCS group, AI department
- Transformer-based zero short text cleaning
- R&D for core parts for CTC end-2-end ASR systems, WFST-based context biasing for end-2-end

2018–2021 — **Researcher/Sr. Researcher**, STC-innovations, Research Department
- R&D of HMM part of hybrid HMM-DNN ASR systems: A lot of finite automata based solutions: Word bounds extraction, algorithms for low latency streaming recognition, algorithms for vocabulary expansion, lattice generation and conversion to confusion network, lattice rescoring with RNN language models

2017–2022 — **Assistant professor**, St. Petersburg State University and St. Petersburg department of Higher School of Economics
- Course on convex optimization (in russian, clickable)

2022–2023 — **Developer**, *Yandex*, Yandex Market

2023–....... — **Principle researcher**, *Huawei*, 2012 laboratories
- Improvement of QUIC protocol for file transfer and real time communication scenarios via congestion control algorithms
- Techlead of the R&D project on forward error correction codes and their applications to real time communication data transfer: a lot of advanced Reed-Solomon and convolutional code implementations.
- Author of TechArena 2025 SPbSU challenge

Languages

- russian: native, english: fluent

Education

2008–2013 — **Master degree**, GPA: 4.5/5, St. Petersburg State University, St. Petersburg, Russia

2013–2017 — **Ph.D. in computer science (candidate of science)**, St. Petersburg State University, St. Petersburg, Russia
- **Ph.D. Thesis:** "*Randomized resource distribution algorithms in multiagent systems*," under supervision of **Prof. Oleg Granichin**

Skills

- **Strong algorithmic skills**
  Developed performance demanding real time systems for different application areas: a lot of graph/finite automata routines for HMM part of ASR systems, finite field computations and coding theory for data protection, SOTA implementations of succinct data structures

- **Strong with C/C++**
  Prime programming language, lead and mainained several algorithmically rich C/C++ projects of medium size (10^5-10^6 lines of code), experienced with hardware-aware optimization, i.e. cache locality improvement and manual SIMD impementations.
- **Strong mathematical background**
  Candidate of science in the computer science field (candidate of physics/math, russian). All of my successful projects were mathematically rich.
- **Strong with Python**
  Prime programming language for scripting/prototyping, typically experimenting in Jupyter with vast usage of numpy, scipy, sklearn, matplotlib, pytorch/torchscript. For some specific bottleneck cases I know how to write a C/C++ library and invoke it from Python.
- **Strong with ASR frameworks**
  Developed projects that were based on kaldi, DeepSpeech, Nemo.
- **Decent with microservice stack**
  Have experience with building microservices with Docker, gRPC, Kubernetes
- **Decent leading skills**
  My major achievement of the last year is leading (in both technical and management sense) a group of algorithmically skillful undergraduates, two of them were first year students with IOI gold medals. I organized a clear workflow that made it easy for them to contribute a clear code despite their lack of experience in development.