Rasul Kairgeldin

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Google Scholar: https://scholar.google.com/citations?user=N8vIYW8AAAAJ&hl=en&oi=ao

Education

- **University of California, Merced** — Merced, CA
  PhD, Machine Learning and Optimization; GPA: 3.86. Advisor: Miguel. A. Carreira-Perpiñán — *Jan. 2022 – Present*
- **Nazarbayev University** — Astana, Kazakhstan
  Master of Science in Electrical And Computer Engineering; GPA: 3.67/4.00 (with Honors) — *Aug. 2018 – Jun. 2020*
- **Nazarbayev University** — Astana, Kazakhstan
  Bachelor of Engineering in Electrical and Electronic Engineering; GPA: 3.66/4.00 — *Aug. 2013 – Jun. 2018*

Experience

- **University of California, Merced** — Merced, CA
  Graduate Research/Teaching Assistant — *Jan. 2022 – Present*
  - **Member of machine learning research group. Research directions**: Tree Alternating Optimization; Learning Compression algorithm for finding optimally compressed neural networks.
  - **TA for the following courses**: Introduction to Machine Learning, Introduction to Artificial Intelligence, Advanced Programming, Algorithm Design and Analysis, Data Structures.
- **Meta** — Bellevue, WA
  PhD Software Engineer Intern at Ranking & Foundational AI team — *May. 2025 – Aug. 2025*
  - Neural architecture search for Atlas v2 User and Ad embeddings
  - VQ-VAE based solution for user embedding diversification
- **Meta** — Menlo Park, CA
  PhD Software Engineer Intern in Core ML team — *May. 2024 – Aug. 2024*
  - Improved the neural network compression for large recommendation systems on next-generation Meta Training and Inference Accelerator (MTIA).
  - Identified the best quantization strategy for sparse embedding quantization. Results were proven experimentally in terms of QPS and normalized entropy.
  - Developed quantization scheme for dynamic int8 quantization of fully connected layers in multiple models.
- **Nazarbayev University(#1 national institution in research)** — Astana, Kazakhstan
  Research Assistant — *Aug. 2018 – Jul. 2021*
  - **Member of Complex Networks and Systems Laboratory. Research directions**: Deep learning approach to optimal activity control over multilayer networks; Time-series prediction of information diffusion in complex networks.
  - Developed and deployed 2 web scraping solutions for analysis processes.
  - Innovated machine learning-based algorithms for link prediction in temporal networks, resulting in a 3% improvement in accuracy.
- **Astana IT University** — Astana, Kazakhstan
  Lecturer — *Sep. 2020 – Jul. 2021*
  - **Courses**: Algorithms and Data Structures, Advanced programming in C/C++, Web technologies.
  - Designed comprehensive course materials for 3 courses, including interactive lectures, assignments, and assessments
  - Coordinated and supervised student projects, guiding project development and ensuring successful completion.

- **Nazarbayev University AI Lab (#1 national institution in research)** Astana, Kazakhstan
  Machine Learning Engineer *Jan. 2018 – Sep. 2019*
  - Engineered innovative AI solutions.
  - Enhanced machine learning models for face tracking and recognition on edge devices, achieving a 4% increase in predictive accuracy and a 15% reduction in inference time.
  - Designed generative deep learning models for face unmasking.
- **DAR** Astana, Kazakhstan
  Backend Developer Intern *Jun.2020 – Aug. 2020*
  - Developed backend in Scala and Java

Publications

- [**ICIP2025**] R. Kairgeldin and M. A. Carreira-Perpiñán. Fast Image Vector Quantization Using Sparse Oblique Regression Trees. 2025 IEEE International Conference on Image Processing (ICIP), Anchorage, AK, USA, Sep. 14-17, 2025.
- [**NeSy2025**] R. Kairgeldin and M. A. Carreira-Perpiñán. Neurosymbolic models based on hybrids of convolutional neural networks and decision trees. 19th International Conference on Neurosymbolic Learning and Reasoning, Santa Cruz, CA, USA, Sep. 8-10, 2025.
- [**IAI Workshop at NeurIPS 2024**] R. Kairgeldin and M. A. Carreira-Perpiñán. Bivariate decision trees: Smaller, interpretable, more accurate. IAI Workshop at NeurIPS 2024, Vancouver, British Columbia, Canada, Dec. 15, 2024.
- [**UAI 2024**] R. Kairgeldin, M. Gabidolla, and M. A. Carreira-Perpiñán. Adaptive softmax trees for many-class classification. In Proc. of the 40th Conf. Uncertainty in Artificial Intelligence (UAI 2024), Barcelona, Spain, July 15–19 2024.
- [**KDD 2024**] R. Kairgeldin and M. A. Carreira-Perpiñán. Bivariate decision trees: Smaller, interpretable, more accurate. In Proc. of the 30th ACM SIGKDD Int. Conf. Knowledge Discovery and Data Mining (SIGKDD 2024), pages 1336–1347, Barcelona, Spain, Aug. 25–29 2024.
- [**BayLearn 2024**] R. Kairgeldin, M. Gabidolla, and M. A. Carreira-Perpiñán. Adaptive softmax trees for many-class classification. Extended abstract at Bay Area Machine Learning Symposium, 2024.
- [**BayLearn 2023**] R. Kairgeldin and M. A. Carreira-Perpiñán. Bivariate decision trees. Extended abstract at Bay Area Machine Learning Symposium, 2023.
- [**IEEE Transactions on Computational Social Systems**] M. Moradian, A. Dadlani, R. Kairgeldin and A. Khonsari, "Cost-Effective Activity Control of Asymptomatic Carriers in Layered Temporal Social Networks," in IEEE Transactions on Computational Social Systems, 2024

Professional Activities

- **Reviewer:** Conference on Neural Information Processing Systems (NeurIPS), since 2024.
- **Reviewer:** Journal on Machine Learning Research Conference on Learning Representations (Journal of Machine Learning Research (JMLR), since 2024.
- **Reviewer:** ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD), since 2024.
- **Reviewer:** International Conference on Learning Representations (ICLR), since 2024.
- **Reviewer:** The international journal Advances in Data Analysis and Classification (ADAC), since 2022.

Technical Skills

- **Programming Languages**: Python, C/C++, Matlab, Java, C#.
- **Frameworks**: pytorch, tensorflow, keras, scikit-learn, numpy, libsvm/liblinear, gurobi, scipy, etc.

Languages

English (fluent), Russian (native), Kazakh (fluent)