

Arman Zharmagambetov, Ph.D.

CONTACT INFORMATION	Location: Menlo Park, CA, USA E-mail: armanz@meta.com ; azharmagambetov@ucmerced.edu WWW: https://arman-z.github.io/
RESEARCH INTERESTS	Machine Learning, Optimization, Decision Trees and Tree-based Models, AI-guided Optimization
EDUCATION	University of California , Merced, CA Ph.D., Machine Learning and Optimization, Dec 2022 <ul style="list-style-type: none">• Advisor: Miguel Á. Carreira-Perpiñán• Ph.D. thesis: <i>Learning Tree-Based Models with Manifold Regularization: Alternating Optimization Algorithms</i> International Information Technologies University (IITU) , Almaty, Kazakhstan M.S., Mathematical and Computer modeling, Jul 2017 <ul style="list-style-type: none">• M.S. thesis: <i>Numerical methods for solving Fredholm Integral-Differential equations.</i> B.S. (summa cum laude), Mathematical and Computer modeling, Jul 2015
PROFESSIONAL EXPERIENCE	Postdoctoral Researcher Jan 2022 to present Meta AI (FAIR) Topics: AI-guided optimization, Reinforcement Learning. Research/Teaching Assistant Aug 2017 to Dec 2022 University of California , Merced Member of the machine learning research group . TA for the following courses: Algorithm Design and Analysis; Object Oriented Programming. Applied Scientist Intern May 2020 – Aug 2020 and May 2021 – Aug 2021 Amazon, Cambridge, Massachusetts. Amazon Alexa. Hosts: Qingming Tang , Ming Sun . Improved Representation Learning for Acoustic Event Classification Using Tree-structured Ontology (ICASSP '22): link to the paper . ML Engineer Jul 2016 to Jul 2017 Kaspi bank , Almaty, Kazakhstan Developed AI/ML based solutions for financial sector: default prediction, fraud detection, recommender systems, etc. ML Engineer Jul 2014 to Feb 2017 Alem Research LLP , Almaty, Kazakhstan Designed and deployed ML models for natural language processing tasks: sentiment classification of news articles, clustering documents in Kazakh and Russian languages.
PUBLICATIONS	[Google Scholar page] <ol style="list-style-type: none">1. [NeurIPS] A. Zharmagambetov and M. Á. Carreira-Perpiñán. Semi-Supervised Learning with Decision Trees: Graph Laplacian Tree Alternating Optimization. Advances in Neural Information Processing Systems, to appear, 2022.2. [AISTATS] A. Zharmagambetov and M. Á. Carreira-Perpiñán. Learning Interpretable, Tree-Based Projection Mappings for Nonlinear Embeddings. International Conf. on Artificial Intelligence and Statistics, 2022.

3. [EMNLP] A. Zharmagambetov, M. Gabidolla and M. Á. Carreira-Perpiñán. Softmax Tree: An Accurate, Fast Classifier When the Number of Classes Is Large. Conf. on Empirical Methods in Natural Language Processing, 2021.
4. [ICML] A. Zharmagambetov and M. Á. Carreira-Perpiñán. Smaller, More Accurate Regression Forests Using Tree Alternating Optimization. International Conf. on Machine Learning, 2020.
5. [ICASSP] A. Zharmagambetov, Q. Tang, C.-C. Kao, Q. Zhang, M. Sun, V. Rozgic, J. Droppo, C. Wang. Improved Representation Learning for Acoustic Event Classification Using Tree-structured Ontology. IEEE International Conf. on Acoustics, Speech and Signal Processing, 2022.
6. [ICASSP] A. Zharmagambetov and M. Á. Carreira-Perpiñán. Learning a Tree of Neural Nets. IEEE International Conf. on Acoustics, Speech and Signal Processing, 2021.
7. Y. Idelbayev, A. Zharmagambetov, M. Gabidolla and M. Á. Carreira-Perpiñán. Faster Neural Net Inference via Forests of Sparse Oblique Decision Trees. 2021.
8. [IJCNN] A. Zharmagambetov and M. Gabidolla and M. Á. Carreira-Perpiñán. Improved Boosted Regression Forests Through Non-Greedy Tree Optimization. International Joint Conf. on Neural Networks, 2021.
9. [IJCNN] A. Zharmagambetov and S. S. Hada and M. Gabidolla and M. Á. Carreira-Perpiñán. Non-Greedy Algorithms for Decision Tree Optimization: An Experimental Comparison. International Joint Conf. on Neural Networks, 2021.
10. [ICIP] A. Zharmagambetov and M. Gabidolla and M. Á. Carreira-Perpiñán. Improved Multiclass AdaBoost for Image Classification: The Role of Tree Optimization. IEEE International Conf. on Image Processing, 2021.
11. [ICIP] A. Zharmagambetov and M. Á. Carreira-Perpiñán. A Simple, Effective Way to Improve Neural Net Classification: Ensembling Unit Activations with a Sparse Oblique Decision Tree. IEEE International Conf. on Image Processing, 2021.
12. [ICIP] S.S.Hada, M. Á. Carreira-Perpiñán, A. Zharmagambetov. Understanding and Manipulating Neural Net Features Using Sparse Oblique Classification Trees. IEEE International Conf. on Image Processing, 2021.
13. [FODS] M. Á. Carreira-Perpiñán and A. Zharmagambetov. Ensembles of bagged TAO trees consistently improve over Random Forests, AdaBoost and Gradient Boosting. ACM-IMS Foundations of Data Science Conf., 2020.
14. S. Narynov and A. Zharmagambetov. On One Approach of Solving Sentiment Analysis Task for Kazakh and Russian Languages Using Deep Learning. Int. Conf. on Computational Collective Intelligence (ICCCI), Halkidiki, Greece, 2016. Springer.
15. A. A. Pak, S. Narynov, A. Zharmagambetov, Sh. Sagyndykova, Zh. Kenzhebayeva. The Method of Synonyms Extraction from Unannotated Corpus. In proceedings of the IEEE 3rd Int. Conf. on Digital Information, Networking, and Wireless Communications (DINWC), Moscow, Russia, 2015.
1. [BayLearn] M. Gabidolla and A. Zharmagambetov and M. Á. Carreira-Perpiñán. Boosted Sparse Oblique Decision Trees. Bay Area Machine Learning Symposium, 2020.
2. [BayLearn] M. Á. Carreira-Perpiñán and A. Zharmagambetov. Fast Model Compression. Bay Area Machine Learning Symposium, 2018.

PROFESSIONAL ACTIVITIES	<p>Reviewer for the following conferences:</p> <ul style="list-style-type: none"> • Neural Information Processing Systems (NeurIPS), since 2020. • International Conf. Machine Learning (ICML), since 2020. • AAAI Conf. on Artificial Intelligence (AAAI), since 2020. • International Conf. on Artificial Intelligence and Statistics (AISTATS), since 2021. • International Conf. on Learning Representations (ICLR), since 2021.
AWARDS	<ul style="list-style-type: none"> • Scholar Award from NeurIPS 2022 organizing committee, ~\$2000 Nov 2022 • D&I travel award from EMNLP 2021 organizing committee, ~\$2000 Nov 2021 • UC Merced Outstanding Teaching Award (\$1000) May 2019 • UC Merced Chancellor's Graduate Fellowship (\$16000) August 2017 • ML Challenge winner (programming contest, Almaty, KZ) January 2015 • Hackday winner (projects contest, Almaty, KZ) April 2013
INVITED TALKS	<ul style="list-style-type: none"> • Research webinar at NTR, Remote Dec 2022 • IICT, Almaty, Kazakhstan Jan 2022 Topic: "TAO: Efficient and Universal Algorithm to Train Decision Trees and Tree-Based Models." • Research webinar at NTR, Remote Jul 2021 • IITU, Almaty, Kazakhstan Dec 2018 Applied mathematics department seminar. Topic: "Modern approaches in neural net compression." • Artificial Intelligence Day, Almaty, Kazakhstan Mar 2017 Topic: "Sentiment Analysis Task for Kazakh and Russian Languages Using Deep Learning" • KBTU IT talks, Almaty, Kazakhstan Jul 2016 Topic: "Machine learning in banks"
TECHNICAL SKILLS	<ul style="list-style-type: none"> • Programming languages: Python, Matlab, Java, C/C++, C#; • Operating Systems: Linux, MacOS, Windows; • Frameworks: pytorch, tensorflow, keras, scikit-learn, numpy, libsvm/liblinear, etc.;
LANGUAGES	Kazakh (native), Russian (fluent), English (fluent)