Homayun Afrabandpey

Curriculum Vitae

✉ *homayun.it@gmail.com*
⌂ *https://homayunafra.github.io*

Positions

Oct. 2020 –	**Senior machine learning scientist**, *Nokia Technologies.*
Apr.–Oct. 2020	**Postdoctoral researcher**, *University of Helsinki, Finland.*
Jan.–Apr. 2020	**Visiting researcher**, *Sony AI, Tokyo, Japan.*

Education

2015–2019	**Ph.D. candidate in Dept. of Computer Science,** School of Science, Aalto University.
	Advisor: Prof. Samuel Kaski.
2012–2014	**M.Sc. in Computer Science,** Dept. of Electrical and Computer Engineering, Isfahan University of Technology.
	Advisor: Dr. Mehran Safayani.
2007–2011	**BS in Information Technology (IT) Engineering,** Dept. of Electrical and Computer Engineering, Isfahan University of Technology.

Research Interests

Machine Learning	**Probabilistic Modeling, Interpretable ML, Federated Learning, Neural Network Compression**.

Publications

Journal Publications

Oct. 2020	**H. Afrabandpey**, T. Peltola, J. Piironen, A. Vehtari, S. Kaski. "A decision theoretic approach for model interpretability in bayesian framework.", *Machine Learning 109(9)*, pp. 1855-1876.
June 2019	J. S. Sartakhti, **H. Afrabandpey**, N. Ghadiri. "Fuzzy least squares twin support vector machine", *Engineering Applications of Artificial Intelligence 85*, pp. 402-409.
March 2018	I. Sundin, T. Peltola, L. Micallef, **H. Afrabandpey**, M. Soare, M. M. Majumder, P. Daee, Y. Chen, C. Heckman, G. Jaccuci, P. Martinen, S. Kaski. "Improving genomics-based predictions for precision medicine through active elicitation of expert knowledge", *Bioinformatics 34 (13)*, pp. i395-i403.
July 2017	M. Safayani, S. H. Ahmadi, **H. Afrabandpey**, A. Mirzaei. "An EM based probabilistic two-dimensional canonical correlation analysis with application in face recognition", *Applied Intelligence*, pp. 1-16.

Feb. 2016	J. S. Sartakhti, **H. Afrabandpey**, M Saraee. "Simulated annealing least squares twin support vector machine (SA-LSTSVM) for pattern classification", *Soft Computing 21 (15)*, pp. 4361-4373.

Conference Paper

Aug. 2022	**H. Afrabandpey**, G. Rangu, H. Zhang, F. Cricri, E. Aksu, H.R. Tavakoli. "On the importance of temporal dependencies of weight updates in communication efficient federated learning", *International Conference on Visual Communications and Image Processing (VCIP) 2022*, Suzhou, China.
June 2022	G. Rangu, **H. Afrabandpey**, F. Cricri, H. Zhang, E. Aksu, M. Hannuksela, H.R. Tavakoli. "Stochastic binary-ternary quantization for communication efficient federated computation", *International Conference on Image Processing (ICIP) 2022*, Bordeaux, France.
Sep. 2021	V. Tanskanen, C. Rajani, **H. Afrabandpey**, A. Putkonen, A. Nioche. "Modeling risky choices in unknown environments", *Asian Conference on Machine Learning (ACML) 2021*, Online.
April 2021	**H. Afrabandpey**, A. Muravev, H. R. Tavakoli, H. Zhang, F. Cricri, M. Gabouj, E. Aksu. "Mind the structure: adopting structural information for deep neural network compression", *International Conference on Image Processing (ICIP) 2021*, Online.
May 2019	**H. Afrabandpey**, T. Peltola, S. Kaski. "Human-in-the-loop active covariance learning for improving predictions in small data sets", *International Joint Conference on Artificial Intelligence(IJCAI) 2019*, Macao, China.
July 2017	**H. Afrabandpey**, T. Peltola, S. Kaski. "Interactive prior elicitation of feature similarities for small sample size prediction", *International Conference on User Modelling, Adaptation and Personalization (UMAP)*, Bratislava, Slovakia.
March 2016	S. Virtanen, **H. Afrabandpey**, S. Kaski. "Visualizations relevant to the user by multi-view latent variable factorization", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Shanghai, China, pp. 2464-2468.
Oct. 2014	**H. Afrabandpey**, M. Safayani. "Probabilistic two-dimensional canonical correlation analysis for face recognition", *IEEE International eConference on Computer and Knowledge Engineering (ICCKE)*, Mashhad, Iran, pp. 1-6.
Feb. 2014	**H. Afrabandpey**, M. Ghaffari, A. Mirzaei, M. Safayani. "A Novel Bat Algorithm Based on Chaos for Optimization Tasks", *IEEE Iranian Conference on Intelligent Systems (ICIS)*, Kerman, Iran, pp. 1-6.

Workshop Papers

Oct. 2022	**H. Afrabandpey**, M. Spranger. "Feasibile and desirable counterfactual generation by preserving human defined constraints", *NeurIPS Workshop on Human-in-the-Loop Learning (HiLL)*, New Orleans, USA.
Jun 2017	I. Sundin, T. Peltola, M. M. Majumder, P. Daee, M. Soare, **H. Afrabandpey**, C. Heckman, S. Kaski, P. Martinen. "Ask the doctor - Improving drug sensitivity predictions through active expert knowledge elicitation", 11th *International Workshop on Machine Learning in Systems Biology (MLSB)*, Prague, Czech Republic.
March 2017	**H. Afrabandpey**, T. Peltola, S. Kaski. "Improving small sample size prediction by interactive prior elicitation of features pairwise similarities", *IUI Workshop on Exploratory Search and Interactive Data Analytics (ESIDA)*, Limassol, Cyprus.
Dec. 2016	**H. Afrabandpey**, T. Peltola, S. Kaski. "Regression analysis in small-n-large-p using interactive prior elicitation of features pairwise similarities", *NIPS Workshop on Future of Interactive Learning Machines*, Barcelona, Spain.

Patents

June 2023	Predictive and Residual Coding of Sparse Signals for Weight Update Compression, *US Patent App. 18/097*, 579.
Oct. 2022	Compression framework for distributed or federated learning with predictive compression paradigm, *US Patent App. 17/717*, 729.

Research Services

Reviewer	IEEE Transactions on Neural Network and Learning Systems (TNNLS).
	Engineering Applications of Artificial Intelligence (EAAI) Journal.
	Journal of Neural Computing and Application (NCA).
	ACM International Conference on Fairness, Accountability, and Transparency (FAccT) 2023.
	Asian Conference on Machine Learning (ACML) 2022.
	European Conference on Machine Learning (ECML) 2021, 2023.
	AAAI Conference on Artificial Intelligence (AAAI) 2018.
	International Joint Conference on Artificial Intelligence (IJCAI) 2017.
Organizer (2019-2020)	Machine Learning Coffee Seminar, `hiit.fi/mlseminar`.

Honors and Awards

Awarded **3K €** scholarship, Helsinki Institute for Information Technology, October 2019.

Awarded **9K €** scholarship, Finnish Foundation for Technology Promotion (Tekniikan Edistamissaatio), April 2019.

Awarded **3K €** scholarship, HPY Research Foundation, March 2019.

Awarded **15K €** scholarship, Foundation for Aalto University Science and Technology, June 2018.

Accepted for Machine Learning Summer School (MLSS'18) with travel grant, Madrid, Spain, August 2018.

Awarded **full year scholarship worth 25K €**, Finnish Academy of Science and Letters (Suomalainen Tiedeakatemia), November 2017, *acceptance rate: 8%*.

Awarded **Student Travel Scholarship**, International Conference on User Modeling, Adaptation, and Personalization (UMAP), Bratislava, Slovakia, July 2017.

Ranked 2$^{\text{nd}}$ among M.Sc. students of Computer Engineering (all three groups: Artificial Intelligence, Computer Architecture, and Software Engineering), Department of Electrical and Computer Engineering, Isfahan University of Technology, November 2014.

Winner of the 2$^{\text{nd}}$ best paper award in the local IEEE Student Paper Contest, Isfahan University of Technology, April 2013.