

MERT KAYAALP

Adaptive Systems Lab, EPFL, Lausanne, Switzerland — mert.kayaalp@epfl.ch — Google Scholar

PROFILE

Final year PhD candidate at EPFL, with a focus on machine learning, multi-agent systems, social networks, statistical and time-series signal processing, and causal inference.

EDUCATION

Ph.D., École Polytechnique Fédérale de Lausanne (EPFL) Computer and Communication Sciences Thesis Topic: Social Learning and Reasoning under Uncertainty	2019-2024 Lausanne, Switzerland Advisor: Prof. Ali H. Sayed
B.S., Koç University Electrical and Electronics Engineering GPA: 4.14 / 4.30, Semahat Arsel Scholar & Vehbi Koç Honor Awardee	2015-2019 Istanbul, Turkey
Ankara High School of Science Physics Olympiad Team, IPhO medalist	2011-2015 Ankara, Turkey

HONORS AND AWARDS

Best Student Paper Award – IEEE Statistical Signal Processing Workshop	Hanoi, Vietnam, Jul 2023
Rising Stars in Signal Processing - IEEE ICASSP	Rhodes, Greece, Jun 2023
Bronze Medal - International Physics Olympiad (IPhO)	Mumbai, India, Jul 2015
Silver Medal - Turkish National Physics Olympiad (TUBITAK)	Dec 2014, Dec 2013
Turkish National University Entrance Examination (LYS) 1st out of 1.8 million participants (with IPhO points), 4th based on exam scores only.	Jun 2015 Score: 586/560

TEACHING

Teaching assistant

Information, Computation and Communication (BS)	Fall 2021, 2023
Adaptation and Learning (MS)	Spring 2022
Advanced Machine Learning (MS)	Spring 2021
Large-Scale Data Science for Real-World Data (MS)	Spring 2020
Analysis I (BS)	Fall 2020

Mentorship

Fatima Ghadieh, BS, American University of Beirut, Lebanon	Summer 2022
Ching-Fang Li, MS, National Taiwan University, Taiwan	Summer 2022
Mert Cemri, BS, Bilkent University, Turkey	Summer 2022
Elyas Benyamina, MS, Université Pierre et Marie Curie (UPMC), France	Summer 2023
Eduardo Faria Cabrera, BS, University of Sao Paulo, Brazil	Fall 2023

PUBLICATIONS

PRE-PRINTS

1. M. Kayaalp and A. H. Sayed, “Causal influences over social learning networks”, *under review in Journal of Machine Learning Research*, arXiv:2307.09575 [cs.SI]
2. P. Hu, V. Bordignon, M. Kayaalp, and A. H. Sayed, “Non-asymptotic performance of social machine learning under limited data”, *under review in IEEE Transactions on Pattern Analysis and Machine Intelligence*, arXiv:2306.09397

JOURNAL

1. M. Kayaalp, V. Bordignon, and A. H. Sayed, “Social opinion formation and decision making under communication trends”, *IEEE Transactions on Signal Processing*, 2024, arXiv:2203.02466 [eess.SP]
2. M. Kayaalp, Y. Inan, E. Telatar, A. H. Sayed, “On the arithmetic and geometric fusion of beliefs for distributed inference,” *IEEE Transactions on Automatic Control*, November 2023, arXiv:2204.13741 [eess.SP]
3. M. Kayaalp, F. Ghadieh, and A. H. Sayed, “Policy evaluation in decentralized POMDPs with belief sharing,” *IEEE Open Journal of Control Systems*, vol. 2, pp. 125-145, June 2023
4. V. Shumovskaia, M. Kayaalp, M. Cemri, and A. H. Sayed, “Discovering influencers in opinion formation over social graphs,” *IEEE Open Journal of Signal Processing*, vol. 4, pp. 188-207, March 2023

5. M. Kayaalp, S. Vlaski, and A. H. Sayed, "Dif-MAML: Decentralized multi-agent meta-learning," *IEEE Open Journal of Signal Processing*, vol. 3, pp. 71-93, January 2022

CONFERENCE

1. V. Shumovskaia, M. Kayaalp, and A. H. Sayed, "Distributed decision-making for community structured networks," *IEEE ICASSP*, Seoul, Korea, April 2024
2. V. Bordignon, M. Kayaalp, V. Matta, and A. H. Sayed, "Social learning with non-Bayesian local updates," *EU-SIPCO*, Helsinki, Finland, September 2023
3. M. Kayaalp, Y. Inan, V. Koivunen, E. Telatar, and A. H. Sayed, "On the fusion strategies for federated decision making," *IEEE Statistical Signal Processing Workshop (SSP)*, Hanoi, Vietnam, July 2023, (**award winning article**).
4. V. Shumovskaia, M. Kayaalp, and A. H. Sayed, "Identifying opinion influencers over social networks," *IEEE ICASSP*, Rhodes Island, Greece, June 2023
5. P. Hu, V. Bordignon, M. Kayaalp, and A. H. Sayed, "Performance of social machine learning under limited data," *IEEE ICASSP*, Rhodes Island, Greece, June 2023
6. M. Cemri, V. Bordignon, M. Kayaalp, V. Shumovskaia, and A. H. Sayed, "Asynchronous social learning," *IEEE ICASSP*, Rhodes Island, Greece, June 2023
7. Y. Inan, M. Kayaalp, E. Telatar, and A. H. Sayed, "Social learning under randomized collaborations," *IEEE Int. Symp. Information Theory (ISIT)*, Helsinki, Finland, June 2022
8. M. Kayaalp, V. Bordignon, S. Vlaski, and A. H. Sayed, "Hidden Markov modeling over graphs," *IEEE Data Science and Learning Workshop (DSLW)*, Singapore, May 2022
9. Y. Inan, M. Kayaalp, A. H. Sayed, and E. Telatar, "A fundamental limit of distributed hypothesis testing under memoryless quantization," *IEEE ICC*, Seoul, South Korea, May 2022
10. M. Kayaalp, S. Vlaski, and A. H. Sayed, "Distributed meta-learning with networked agents," *EUSIPCO*, Dublin, Ireland, August 2021

CONFERENCE AND INVITED TALKS

1. "On the Fusion Strategies for Federated Decision Making", Poster presentation at IEEE SSP, Hanoi, July 2023
2. "Interpretable and Socially Intelligent Systems", Poster presentation at Rising Stars in Signal Processing Workshop, IEEE ICASSP, Rhodes, June 2023
3. "Asynchronous Social Learning", Poster presentation at IEEE ICASSP, Rhodes, June 2023
4. "Social Learning under Randomized Collaborations", Oral presentation at IEEE ISIT, Helsinki, July 2022
5. "Hidden Markov Modeling over Graphs", Oral presentation at IEEE DSLW, Online, May 2022
6. "Distributed Meta-Learning with Networked Agents", Oral presentation at EUSIPCO, Online, August 2021

EXPERIENCE

Research Internship , Tandon School of Engineering, New York University Research assistant in the Communication and Information Theory (CommIT) Group	Jun 2018 - Sep 2018 New York, US
Software Engineer Intern , Comodo Cybersecurity Contribution to database migration project with Java and MongoDB	Jun 2017 - Jul 2017 Ankara, Turkey

SERVICE

Reviewer

IEEE ICASSP (International Conference on Acoustics, Speech and Signal Processing)
IEEE CDC (Conference on Decision and Control)
IEEE Signal Processing Letters
IEEE Transactions on Mobile Computing
AISTATS (International Conference on Artificial Intelligence and Statistics)
IEEE Open Journal of Signal Processing
IEEE Transactions on Signal Processing

REFERENCES

Ali H. Sayed <i>Dean of Engineering</i> EPFL, Switzerland ali.sayed@epfl.ch	Emre Telatar <i>Full Professor</i> EPFL, Switzerland emre.telatar@epfl.ch	Visa Koivunen <i>Distinguished Professor</i> Aalto University, Finland visa.koivunen@aalto.fi
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