# MERT KAYAALP

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

## PROFILE

Final year Ph.D. 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)**     2019-2024
Computer and Communication Sciences     Lausanne, Switzerland
Thesis Topic: Social Learning and Reasoning under Uncertainty     Advisor: Prof. Ali H. Sayed

**B.S., Koç University**     2015-2019
Electrical and Electronics Engineering     Istanbul, Turkey
GPA: 4.14 / 4.30, Semahat Arsel Scholar & Vehbi Koç Honor Awardee

**Ankara High School of Science**     2011-2015
Physics Olympiad Team, IPhO medalist     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)**     Jun 2015
1st out of 1.8 million participants (with IPhO points), 4th based on exam scores only.     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
3. V. Shumovskaia, M. Kayaalp, and A. H. Sayed, "Social learning in community structured graphs," *under review in IEEE Transactions on Signal Processing*, arXiv:2312.12186 [cs.SI]

### 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, and 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," *EUSIPCO*, 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. "Collaborative Decision Making over Ad-hoc Networks", *Invited talk at Ford Otosan Automotive Technologies Laboratory*, Online, December 2023

2. "On the Fusion Strategies for Federated Decision Making", *Poster presentation at IEEE SSP*, Hanoi, July 2023

3. "Interpretable and Socially Intelligent Systems", *Poster presentation at Rising Stars in Signal Processing Workshop, IEEE ICASSP*, Rhodes, June 2023

4. "Asynchronous Social Learning", *Poster presentation at IEEE ICASSP*, Rhodes, June 2023

5. "Social Learning under Randomized Collaborations", *Oral presentation at IEEE ISIT*, Helsinki, July 2022

6. "Hidden Markov Modeling over Graphs", *Oral presentation at IEEE DSLW*, Online, May 2022

7. "Distributed Meta-Learning with Networked Agents", *Oral presentation at EUSIPCO*, Online, August 2021

## EXPERIENCE

**Research Internship**, Tandon School of Engineering, New York University      Jun 2018 - Sep 2018
Research assistant in the Communication and Information Theory (CommIT) Group      New York, US

**Software Engineer Intern**, Comodo Cybersecurity      Jun 2017 - Jul 2017
Contribution to database migration project with Java and MongoDB      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 | Emre Telatar | Visa Koivunen |
|---|---|---|
| *Dean of Engineering* | *Full Professor* | *Distinguished Professor* |
| EPFL, Switzerland | EPFL, Switzerland | Aalto University, Finland |
| ali.sayed@epfl.ch | emre.telatar@epfl.ch | visa.koivunen@aalto.fi |