Artavazd Maranjyan

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Education

Ph.D. in Computer Science — **Thuwal, Saudi Arabia**
King Abdullah University of Science and Technology (KAUST) — *2023 – Present*
Advisor: Peter Richtárik

M.Sc. in Applied Statistics and Data Science — **Yerevan, Armenia**
Yerevan State University — *2021 – 2023*
Thesis: On local training methods
Co-supervisors: Peter Richtárik, Mher Safaryan

B.Sc. in Informatics and Applied Mathematics — **Yerevan, Armenia**
Yerevan State University — *2017 – 2021*
Thesis: On the Convergence of Series in Classical Systems
supervisor: Martin Grigoryan

Academic Experiences

Researcher in the group of Martin Grigoryan — **Yerevan, Armenia**
Yerevan State University — *April 2023 – Aug 2023*
- Studied the existence and properties of universal functions with respect to the Vilenkin and Haar systems across various functional spaces

Machine Learning Researcher — **Yerevan, Armenia**
YerevaNN — *March 2023 – Aug 2023*
- Worked on the intersection of Federated Learning and Optimization

Internship in the group of Peter Richtárik — **Thuwal, Saudi Arabia**
King Abdullah University of Science and Technology (KAUST) — *June 2022 – Jan 2023*
- Worked on the "GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity" paper

Machine Learning Researcher — **Yerevan, Armenia**
YerevaNN — *Jan 2022 – June 2022*
- Worked on the intersection of Federated Learning and Optimization

Industry Experiences

Co-Founder — **Yerevan, Armenia**
OnePick — *July 2021 – June 2022*
OnePick is an emerging startup that provides up-to-date and customized social media posts based on page and market data analysis
- Winner idea of InVent 2.0 venture building program organized by FAST

Backend Developer — **Yerevan, Armenia**
EXALT Technologies Ltd — *July 2021 – Sep 2021*
- Worked for Nutanix.

Machine Learning Research Engineer — **Yerevan, Armenia**
Foundation for Armenian Science and Technology (FAST) — *June 2021 – July 2021*

- Worked on Fraud detection
- Made data-driven forecasts using machine learning algorithms and statistical models

○ **Software Engineer in Test** — **Yerevan, Armenia**
Picsart — *Sep 2019 – Jan 2021*

- Worked with automation team to design and develop automated solutions across several mobile/web applications
- Worked directly with software developers, test engineers, product owners, business analysts to find and resolve issues
- Worked closely with DevOps to suggest improvements in processes and in Jenkins Continuous Integration cycle

Awards

○ **Dean's Award**
King Abdullah University of Science and Technology (KAUST) — *Sep 2023*
Awarded to a few top students accepted to KAUST (6000$ annually for 3 years)

○ **Outstanding Final Project Award**
Yerevan State University — *May 2021*
Recognized for the Bachelor's thesis (awarded to 6 students among 250+ students)

Papers

8. **Ringmaster ASGD: Asynchronous SGD with Optimal Time Complexities**
Artavazd Maranjyan, Alexander Tyurin, Peter Richtárik
Submitted to ICML2025

7. **Differentially Private Random Block Coordinate Descent**
Artavazd Maranjyan, Abdurakhmon Sadiev, Peter Richtárik
arXiv:2412.17054, 2024

6. **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times**
Artavazd Maranjyan, Omar Shaikh Omar, Peter Richtárik
arXiv:2410.04285, 2024

5. **LoCoDL: Communication-Efficient Distributed Learning with Local Training and Compression**
Laurent Condat, **Artavazd Maranjyan**, Peter Richtárik
arXiv:2403.04348, 2024

4. **Menshov-type theorem for divergence sets of sequences of localized operators**
Martin Grigoryan, Anna Kamont, **Artavazd Maranjyan**
Journal of Contemporary Mathematical Analysis, vol. 58, no. 2, pp. 81–92, 2023

3. **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity**
Artavazd Maranjyan, Mher Safaryan, Peter Richtárik
arXiv:2210.16402, 2022

2. **On the divergence of Fourier series in the general Haar system**
Martin Grigoryan, **Artavazd Maranjyan**
Armenian Journal of Mathematics, vol. 13, p. 1–10, Sep. 2021

1. **On the unconditional convergence of Faber-Schauder series in L^1**
   Tigran Grigoryan, **Artavazd Maranjyan**
   Proceedings of the YSU A: Physical and Mathematical Sciences, vol. 55, no. 1 (254), pp. 12–19, 2021

Academic and Professional Involvement

Reviewer
SIAM Journal on Mathematics of Data Science (SIMODS) 2024
Transactions on Machine Learning Research (TMLR) 2024
The Journal of Machine Learning Research (JMLR) 2024

Mentorship
Co-mentored a group of schoolgirls from diverse backgrounds and grades on a STEM project. The students conducted chemical experiments and developed an educational website to document and share their findings. I primarily supported the website's creation. View the website [certificate]

Organized weekly group seminars — **KAUST, Saudi Arabia**
KAUST — *Sep 2023 - Dec 2023*

Talks and Poster Presentations

2024 Talks and Poster Presentations

15. **Workshop on Optimization for Machine Learning (NeurIPS 2024)** — **Vancouver, Canada**
    Vancouver Convention Center — *December 15, 2024*
    Presenting
    - **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times** (**Oral, Top 5%**)
    - **Differentially Private Random Block Coordinate Descent**
    - **LoCoDL: Communication-Efficient Distributed Learning with Local Training and Compression**

14. **MLR Weekly Seminar** — **Online**
    Machine Learning Research at Apple — *November 21, 2024*
    Invited by **Samy Bengio** to give a talk on **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times** [slides]

13. **Interntional Conference on Algebra, Logic, and their Applications** — **Online**
    Yerevan State University — *October 18, 2024*
    Delivered a talk on **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times**

12. **CEMSE E-Poster Competition** — **KAUST, Saudi Arabia**
    KAUST — *October 10, 2024*
    Awarded 3rd place for presenting a poster on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity**.

11. **Analysis, PDEs and Applications** — **Yerevan, Armenia**
    Yerevan State University — *July 6, 2024*
    Delivered a talk on **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times** [abstract]

10. **Stochastic Numerics and Statistical Learning** — **KAUST, Saudi Arabia**
KAUST — *May 27, 2024*
Presented a poster on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [poster]

9. **CS 331: Stochastic Gradient Descent Methods** — **KAUST, Saudi Arabia**
KAUST — *May 5, 2024*
Delivered a guest lecture on **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times**

8. **The Machine Learning Summer School in Okinawa 2024** — **Okinawa, Japan**
Okinawa Institute of Science and Technology (OIST) — *March 13, 2024*
Presented a poster on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [poster]

7. **KAUST Rising Stars in AI Symposium 2024** — **KAUST, Saudi Arabia**
KAUST — *February 21, 2024*
Presented a poster on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [poster]

2023 Talks and Poster Presentations

6. **Group Seminar** — **KAUST, Saudi Arabia**
KAUST — *November 16, 2023*
Delivered a talk on **Differentially Private Coordinate Descent for Composite Empirical Risk Minimization**

5. **Algorithms & Computationally Intensive Inference seminars** — **Coventry, England**
University of Warwick — *October 6, 2023*
Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [slides]

4. **Mathematics in Armenia: Advances and Perspectives** — **Yerevan, Armenia**
Yerevan State University — *July 5, 2023*
Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [abstract]

3. **Machine Learning Reading Group Yerevan** — **Yerevan, Armenia**
Yerevan State University — *March 10, 2023*
Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [video (Armenian)]

2022 Talks and Poster Presentations

2. **Federated Learning One World Seminar (FLOW)** — **Online**
Online — *December 7, 2022*
Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [video]

1. **Machine Learning Reading Group Yerevan** — **Yerevan, Armenia**
Yerevan State University — *April 10, 2022*
Delivered a talk on **ProxSkip: Yes! Local Gradient Steps Provably Lead to Communication Acceleration! Finally!**

Hobbies

Ultimate Frisbee, Dancing (bachata, salsa), Board Games, Table Football (Foosball)