Artavazd Maranjyan

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Education

Ph.D. in Computer Science — **Thuwal, Saudi Arabia**
King Abdullah University of Science and Technology (KAUST) — *2023 – 2025*
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

Research visit to Yi-Shuai Niu — **Beijing, China**
Beijing Institute of Mathematical Sciences and Applications (BIMSA) — *9-22 March 2025*
- Gave talks at three universities (PKU, BUAA, BIMSA)
- Worked with Professor Yi-Shuai Niu on a project on Server-Assisted Federated Learning

Researcher in the group of Martin Grigoryan — **Yerevan, Armenia**
Yerevan State University — *April 2023 – August 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 – August 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 – January 2023*
- Worked on the "GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity" paper

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

Industry Experiences

Co-Founder — **Yerevan, Armenia**
OnePick — *July 2021 – June 2022*
- Built an MVP platform to help content creators and marketers generate or select photos that best matched their text descriptions
- Participated in the InVent 2.0 venture building program, advancing through team formation, idea generation, product development, and pitching
- Secured initial funding and continued development beyond the program

Backend Developer — **Yerevan, Armenia**
EXALT Technologies Ltd — *July 2021 – September 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 — *September 2019 – January 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

- **CEMSE Dean's List Award**
  King Abdullah University of Science and Technology (KAUST) — *May 2025*
  Awarded for excellent academic and research performance ($2,500 prize)
- **Dean's Award**
  King Abdullah University of Science and Technology (KAUST) — *September 2023*
  Awarded to a few top students accepted to KAUST ($6,000 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)

Publications

11. **Ringleader ASGD: The First Asynchronous SGD with Optimal Time Complexity under Data Heterogeneity**
    Artavazd Maranjyan, Peter Richtárik
    Submitted to ICLR 2026

10. **BiCoLoR: Communication-Efficient Optimization with Bidirectional Compression and Local Training**
    Laurent Condat, Artavazd Maranjyan, Peter Richtárik
    Submitted to ICLR 2026

9. **ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning**
    Artavazd Maranjyan, El Mehdi Saad, Peter Richtárik, Francesco Orabona
    ICML 2025: Forty-Second International Conference on Machine Learning

8. **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity**
    Artavazd Maranjyan, Alexander Tyurin, Peter Richtárik
    ICML 2025: Forty-Second International Conference on Machine Learning

7. **MindFlayer SGD: Efficient Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times**
    Artavazd Maranjyan, Omar Shaikh Omar, Peter Richtárik
    UAI 2025: The 41st Conference on Uncertainty in Artificial Intelligence
    OPT 2024: Optimization for Machine Learning (NeurIPS workshop)
    Oral presentation (top 5% of 107 submissions)

6. **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity**
    Artavazd Maranjyan, Mher Safaryan, Peter Richtárik
    TMLR 2025: Transactions on Machine Learning Research

5. **LoCoDL: Communication-Efficient Distributed Learning with Local Training and Compression**
    Laurent Condat, Artavazd Maranjyan, Peter Richtárik
    ICLR 2025: The Thirteenth International Conference on Learning Representations
    Spotlight presentation (top 5.1% of the submitted papers)

4. **Differentially Private Random Block Coordinate Descent**
    Artavazd Maranjyan, Abdurakhmon Sadiev, Peter Richtárik
    OPT 2024: Optimization for Machine Learning (NeurIPS workshop)

3. **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

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

2024–Now Transactions on Machine Learning Research (TMLR)
2026 International Conference on Learning Representations (ICLR)
2024 SIAM Journal on Mathematics of Data Science (SIMODS)
2024 The Journal of Machine Learning Research (JMLR)

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. [website] [certificate]

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

Talks and Poster Presentations

2025 Talks and Poster Presentations

31. ***AMCS/STAT graduate seminar*** **KAUST, Saudi Arabia**
KAUST *November 13, 2025*
Delivered a talk titled **First Provably Optimal Asynchronous SGD for Homogeneous and Heterogeneous Data**

30. ***The KAUST 2025 Workshop on Statistics*** **KAUST, Saudi Arabia**
KAUST *November 4, 2025*
Presented posters on
- **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [poster]
- **ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning** [poster]

29. ***Mathematics and Applications Colloquium*** **KAUST, Saudi Arabia**
KAUST *October 28, 2025*
Delivered a talk on **Ringleader ASGD: The First Asynchronous SGD with Optimal Time Complexity under Data Heterogeneity** [slides]

28. ***35º Colóquio Brasileiro de Matemática*** **Rio de Janeiro, Brazil**
Instituto Nacional de Matemática Pura e Aplicada (IMPA) *July 27-31, 2025*
Delivered a talk and a poster on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides] [poster]

27. ***41st Conference on Uncertainty in Artificial Intelligence*** **Rio de Janeiro, Brazil**
Rio Othon Palace *July 21-25, 2025*
Presented a poster on **MindFlayer SGD: Efficient Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times** [poster]

26. ***Forty-Second International Conference on Machine Learning*** — **Vancouver, Canada**
Vancouver Convention Center — *July 13-19, 2025*
Presented posters on
- **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [poster]
- **ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning** [poster]

25. ***Stochastic Numerics and Statistical Learning*** — **KAUST, Saudi Arabia**
KAUST — *May 18, 2025*
Presented a poster on **ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning** [poster]

24. ***The Thirteenth International Conference on Learning Representations*** — **Singapore**
Singapore EXPO — *April 24-28, 2025*
Presented a poster on **LoCoDL: Communication-Efficient Distributed Learning with Local Training and Compression** (Spotlight presentation (top 5.1% of the submitted papers))

23. ***Federated Learning One World Seminar (FLOW)*** — **Online**
FLOW Talk #126 — *April 16, 2025*
Delivered a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [video] [slides]

22. ***KAUST Rising Stars in AI Symposium 2025*** — **KAUST, Saudi Arabia**
KAUST — *April 7-10, 2025*
Presented a poster on **ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning** [poster]

21. ***Machine Learning Reading Group*** — **Yerevan, Armenia**
YSU Krisp-AI Lab — *March 28, 2025*
Delivered a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides]

20. ***Flower AI Summit 2025*** — **London, England**
King's House — *March 26, 2025*
Delivered a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides]

19. ***Academic Report of the School of Mathematical Sciences*** — **Beijing, China**
Beihang University (BUAA) — *March 17, 2025*
Invited by Jiaxin Xie to give a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides]

18. ***Optimization Seminar*** — **Beijing, China**
Beijing Institute of Mathematical Sciences and Applications (BIMSA) — *March 13, 2025*
Invited by Yi-Shuai Niu to give a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides]

17. ***Seminar*** — **Beijing, China**
Peking University — *March 12, 2025*
Invited by Kun Yuan to give a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides]

16. ***AMCS/STAT graduate seminar*** — **KAUST, Saudi Arabia**
KAUST — *February 27, 2025*
Delivered a talk on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [slides]

2024 Talks and Poster Presentations

15. ***Workshop on Optimization for Machine Learning (NeurIPS 2024)*** — **Vancouver, Canada**
Vancouver Convention Center — *December 15, 2024*
Presented
- **MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times** (Oral presentation, top 5% of 107 submissions) [video]
- **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. ***International 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, 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**
FLOW Talk #88 *December 7, 2022*
Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [video]

1. ***Machine Learning Reading Group*** **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)