# 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**

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|---|---|
| 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

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*
**KAUST, Saudi Arabia**
*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**
*YSU Krisp-AI Lab*
**Yerevan, Armenia**
*March 28, 2025*
Delivered a talk on **Ringmaster ASGD: The First Asynchronous SGD
with Optimal Time Complexity** [slides]

**20.** **Flower AI Summit 2025**
*King's House*
**London, England**
*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**
*Beihang University (BUAA)*
**Beijing, China**
*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 Institute of Mathematical Sciences and Applications (BIMSA)*
**Beijing, China**
*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**
*Peking University*
**Beijing, China**
*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*
**KAUST, Saudi Arabia**
*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 Convention Center*
**Vancouver, Canada**
*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**
*Machine Learning Research at Apple*
**Online**
*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**
*Yerevan State University*
**Online**
*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*
**KAUST, Saudi Arabia**
*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 State University*
**Yerevan, Armenia**
*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*
**KAUST, Saudi Arabia**
*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*
**KAUST, Saudi Arabia**
*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 Institute of Science and Technology (OIST)*
**Okinawa, Japan**
*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*
**KAUST, Saudi Arabia**
*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*
**KAUST, Saudi Arabia**
*November 16, 2023*

Delivered a talk on **Differentially Private Coordinate Descent for Composite Empirical Risk Minimization**

5. *Algorithms & Computationally Intensive Inference seminars*
*University of Warwick*
**Coventry, England**
*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 State University*
**Yerevan, Armenia**
*July 5, 2023*

Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [abstract]

3. *Machine Learning Reading Group*
*Yerevan State University*
**Yerevan, Armenia**
*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)*
*FLOW Talk #88*
**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 State University*
**Yerevan, Armenia**
*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)