

# Artavazd Maranjyan

✉ arto.maranjyan@gmail.com • 🌐 artomaranjyan.github.io

## Education

- **Ph.D. in Computer Science** Thuwal, Saudi Arabia  
2023 – 2025
  - *King Abdullah University of Science and Technology (KAUST)*  
**Advisor:** Peter Richtárik
    - **Thesis:** First Provably Optimal Asynchronous SGD for Homogeneous and Heterogeneous Data
- **M.Sc. in Applied Statistics and Data Science** Yerevan, Armenia  
2021 – 2023
  - *Yerevan State University*
    - **Thesis:** On local training methods; **co-supervisors:** Peter Richtárik, Mher Safaryan
- **B.Sc. in Informatics and Applied Mathematics** Yerevan, Armenia  
2017 – 2021
  - *Yerevan State University*
    - **Thesis:** On the Convergence of Series in Classical Systems; **supervisor:** Martin Grigoryan

## Academic Experiences

- **Research visit to Yi-Shuai Niu** Beijing, China  
9-22 March 2025
  - *Beijing Institute of Mathematical Sciences and Applications (BIMSA)*
    - 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  
April 2023 – August 2023
  - *Yerevan State University*
    - 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  
March 2023 – August 2023
  - *YerevaNN*
    - Worked on the intersection of Federated Learning and Optimization
- **Internship in the group of Peter Richtárik** Thuwal, Saudi Arabia  
June 2022 – January 2023
  - *King Abdullah University of Science and Technology (KAUST)*
    - Worked on the "GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity" paper
- **Machine Learning Researcher** Yerevan, Armenia  
January 2022 – June 2022
  - *YerevaNN*
    - Worked on the intersection of Federated Learning and Optimization

## Industry Experiences

- **Co-Founder** Yerevan, Armenia  
July 2021 – June 2022
  - *OnePick*
    - 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  
July 2021 – September 2021
  - *EXALT Technologies Ltd*
    - Worked for Nutanix.
- **Machine Learning Research Engineer** Yerevan, Armenia  
June 2021 – July 2021
  - *Foundation for Armenian Science and Technology (FAST)*
    - Worked on Fraud detection
    - Made data-driven forecasts using machine learning algorithms and statistical models

## Software Engineer in Test

- *Picsart*
  - 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

**Yerevan, Armenia**

September 2019 – January 2021

## Awards

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### 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

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11. **Ringleader ASGD: The First Asynchronous SGD with Optimal Time Complexity under Data Heterogeneity**  
Artavazd Maranjanian, Peter Richtárik  
*Submitted to ICLR 2026*
10. **BiCoLoR: Communication-Efficient Optimization with Bidirectional Compression and Local Training**  
Laurent Condat, Artavazd Maranjanian, Peter Richtárik  
*Submitted to ICLR 2026*
9. **ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning**  
Artavazd Maranjanian, 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 Maranjanian, 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 Maranjanian, 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 Maranjanian, 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 Maranjanian, 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 Maranjanian, 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

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### 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

KAUST, Saudi Arabia

September 2023 - Dec 2023

## Talks and Poster Presentations

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### 2025 Talks and Poster Presentations

#### *AMCS/STAT graduate seminar*

31. KAUST

KAUST, Saudi Arabia

November 13, 2025

Delivered a talk titled **First Provably Optimal Asynchronous SGD for Homogeneous and Heterogeneous Data** [[slides](#)]

#### *The KAUST 2025 Workshop on Statistics*

30. KAUST

KAUST, Saudi Arabia

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](#)]

#### *Mathematics and Applications Colloquium*

29. KAUST

KAUST, Saudi Arabia

October 28, 2025

Delivered a talk on **Ringleader ASGD: The First Asynchronous SGD with Optimal Time Complexity under Data Heterogeneity** [[slides](#)]

#### *35º Colóquio Brasileiro de Matemática*

28. Instituto Nacional de Matemática Pura e Aplicada (IMPA)

Rio de Janeiro, Brazil

July 27-31, 2025

Delivered a talk and a poster on **Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity** [[slides](#)] [[poster](#)]

#### *41st Conference on Uncertainty in Artificial Intelligence*

27. Rio Othon Palace

Rio de Janeiro, Brazil

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.	<b>Forty-Second International Conference on Machine Learning</b> Vancouver Convention Center Presented posters on <ul style="list-style-type: none"><li>○ Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [<a href="#">poster</a>]</li><li>○ ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning [<a href="#">poster</a>]</li></ul>	Vancouver, Canada July 13-19, 2025
25.	<b>Stochastic Numerics and Statistical Learning</b> KAUST Presented a poster on ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning [ <a href="#">poster</a> ]	KAUST, Saudi Arabia May 18, 2025
24.	<b>The Thirteenth International Conference on Learning Representations</b> Singapore EXPO Presented a poster on LoCoDL: Communication-Efficient Distributed Learning with Local Training and Compression (Spotlight presentation (top 5.1% of the submitted papers))	Singapore April 24-28, 2025
23.	<b>Federated Learning One World Seminar (FLOW)</b> FLOW Talk #126 Delivered a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">video</a> ] [ <a href="#">slides</a> ]	Online April 16, 2025
22.	<b>KAUST Rising Stars in AI Symposium 2025</b> KAUST Presented a poster on ATA: Adaptive Task Allocation for Efficient Resource Management in Distributed Machine Learning [ <a href="#">poster</a> ]	KAUST, Saudi Arabia April 7-10, 2025
21.	<b>Machine Learning Reading Group</b> YSU Krisp-AI Lab Delivered a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">slides</a> ]	Yerevan, Armenia March 28, 2025
20.	<b>Flower AI Summit 2025</b> King's House Delivered a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">slides</a> ]	London, England March 26, 2025
19.	<b>Academic Report of the School of Mathematical Sciences</b> Beihang University (BUAA) Invited by Jiaxin Xie to give a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">slides</a> ]	Beijing, China March 17, 2025
18.	<b>Optimization Seminar</b> Beijing Institute of Mathematical Sciences and Applications (BIMSA) Invited by Yi-Shuai Niu to give a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">slides</a> ]	Beijing, China March 13, 2025
17.	<b>Seminar</b> Peking University Invited by Kun Yuan to give a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">slides</a> ]	Beijing, China March 12, 2025
16.	<b>AMCS/STAT graduate seminar</b> KAUST Delivered a talk on Ringmaster ASGD: The First Asynchronous SGD with Optimal Time Complexity [ <a href="#">slides</a> ]	KAUST, Saudi Arabia February 27, 2025

## 2024 Talks and Poster Presentations

15.	<b>Workshop on Optimization for Machine Learning (NeurIPS 2024)</b> Vancouver Convention Center Presented <ul style="list-style-type: none"><li>○ MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times (Oral presentation, top 5% of 107 submissions) [<a href="#">video</a>]</li><li>○ Differentially Private Random Block Coordinate Descent</li><li>○ LoCoDL: Communication-Efficient Distributed Learning with Local Training and Compression</li></ul>	Vancouver, Canada December 15, 2024
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	<b>MLR Weekly Seminar</b>	<b>Online</b>
14.	<i>Machine Learning Research at Apple</i> Invited by <a href="#">Samy Bengio</a> to give a talk on <b>MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times</b> [ <a href="#">slides</a> ]	November 21, 2024
13.	<b>International Conference on Algebra, Logic, and their Applications</b> <i>Yerevan State University</i> Delivered a talk on <b>MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times</b>	<b>Online</b> October 18, 2024
12.	<b>CEMSE E-Poster Competition</b> <i>KAUST</i> Awarded 3rd place for presenting a poster on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b>	<b>KAUST, Saudi Arabia</b> October 10, 2024
11.	<b>Analysis, PDEs and Applications</b> <i>Yerevan State University</i> Delivered a talk on <b>MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times</b> [ <a href="#">abstract</a> ]	<b>Yerevan, Armenia</b> July 6, 2024
10.	<b>Stochastic Numerics and Statistical Learning</b> <i>KAUST</i> Presented a poster on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b> [ <a href="#">poster</a> ]	<b>KAUST, Saudi Arabia</b> May 27, 2024
9.	<b>CS 331: Stochastic Gradient Descent Methods</b> <i>KAUST</i> Delivered a guest lecture on <b>MindFlayer: Efficient Asynchronous Parallel SGD in the Presence of Heterogeneous and Random Worker Compute Times</b>	<b>KAUST, Saudi Arabia</b> May 5, 2024
8.	<b>The Machine Learning Summer School in Okinawa 2024</b> <i>Okinawa Institute of Science and Technology (OIST)</i> Presented a poster on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b> [ <a href="#">poster</a> ]	<b>Okinawa, Japan</b> March 13, 2024
7.	<b>KAUST Rising Stars in AI Symposium 2024</b> <i>KAUST</i> Presented a poster on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b> [ <a href="#">poster</a> ]	<b>KAUST, Saudi Arabia</b> February 21, 2024
<b>2023 Talks and Poster Presentations</b>		
6.	<b>Group Seminar</b> <i>KAUST</i> Delivered a talk on <b>Differentially Private Coordinate Descent for Composite Empirical Risk Minimization</b>	<b>KAUST, Saudi Arabia</b> November 16, 2023
5.	<b>Algorithms &amp; Computationally Intensive Inference seminars</b> <i>University of Warwick</i> Delivered a talk on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b> [ <a href="#">slides</a> ]	<b>Coventry, England</b> October 6, 2023
4.	<b>Mathematics in Armenia: Advances and Perspectives</b> <i>Yerevan State University</i> Delivered a talk on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b> [ <a href="#">abstract</a> ]	<b>Yerevan, Armenia</b> July 5, 2023
3.	<b>Machine Learning Reading Group</b> <i>Yerevan State University</i> Delivered a talk on <b>GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity</b> [ <a href="#">video (Armenian)</a> ]	<b>Yerevan, Armenia</b> March 10, 2023

## 2022 Talks and Poster Presentations.....

### **Federated Learning One World Seminar (FLOW)**

2. *FLOW Talk #88*

Delivered a talk on **GradSkip: Communication-Accelerated Local Gradient Methods with Better Computational Complexity** [[video](#)]

**Online**

*December 7, 2022*

### **Machine Learning Reading Group**

1. *Yerevan State University*

Delivered a talk on **ProxSkip: Yes! Local Gradient Steps Provably Lead to Communication Acceleration! Finally!**

**Yerevan, Armenia**

*April 10, 2022*

## Hobbies

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