

# Jiayu Zhang

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## SUMMARY

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Second-year PhD student in Operations Research at Columbia University with experience in machine learning for real-world problem-solving, large-scale optimization, and stochastic methods.

## WORK EXPERIENCE

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**Student Researcher Intern at Cardinal Operations** Shanghai, China, Feb - Sept 2023

- Proved theories on the geometry of the sensor network localization problem.
- Conducted numerical experiments to benchmark first-order methods and semi-definite programming based methods using open source frameworks and commercial solvers.
- Analyzed performance of stochastic methods for large-scale sensor network localization problems.

## PROJECTS

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**Layer-wise Learning Rates in Neural Network Training** July 2025 - present

- Conducted under the supervision of Donald Goldfarb, Lexiao Lai, and Tianyi Lin.
- Designed and implemented adaptive layer-wise optimizers within PyTorch, leveraging large-scale computing resources (NSF Access H100/V100 GPUs).
- Demonstrated improved performance (up to 0.8%) over baselines (e.g., SGD, Adam, and KFAC) when training VGG16 and ResNet32 on CIFAR-10/100 datasets.
- Extended evaluation to language models (e.g., NanoGPT).

## EDUCATION

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2024 - present	PhD student in Operations Research at <b>Columbia University</b>	New York, NY
2020 - 2024	BS in Mathematics at <b>Shanghai Jiao Tong University</b>	Shanghai, China

## PUBLICATIONS

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Mingyu Lei, Jiayu Zhang and Yinyu Ye (Aug. 2023). “Blessing of high-order dimensionality: from non-convex to convex optimization for sensor network localization”. In: *arXiv preprint arXiv:2308.02278*. URL: <https://arxiv.org/abs/2308.02278>.

## SKILLS

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Coding	Python, Linux, Latex, Julia, Matlab
Languages	English (fluent), Mandarin (native speaker)

## AWARDS

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2024 Fall Boyle Fellowship from Columbia University