

# JINGMIN SUN PH.D.

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EMPLOYMENT	<b>Postdoctoral Fellow</b> <i>John Hopkins University</i> <ul style="list-style-type: none"><li>• Advisor: Prof. Mauro Maggioni</li></ul>	2025.07- Baltimore, MD
EDUCATION	<b>Ph.D. in Mathematical Science</b> <i>Carnegie Mellon University</i> <ul style="list-style-type: none"><li>• Advisor: Prof. Hayden Schaeffer (UCLA)</li><li>• Research area: Operator learning, PDE-foundation Model, Optimization, Control problem</li></ul> <b>B.S. in Mathematics</b> <i>Rensselaer Polytechnic Institute</i> <ul style="list-style-type: none"><li>• GPA: 3.98/4.00; Summa Cum Laude</li></ul>	2020.09 - 2025.05 Pittsburgh, PA  2017.09 - 2019.12 Troy, NY
PUBLICATIONS	<ol style="list-style-type: none"><li>1. Derek Jollie, <b>Jingmin Sun</b>, Zecheng Zhang, and Hayden Schaeffer. Time-series forecasting and refinement within a multimodal PDE foundation model. <i>Journal of Machine Learning for Modeling and Computing</i>, 6(2), 77–89.</li><li>2. <b>Jingmin Sun</b>, Yuxuan Liu, Zecheng Zhang, and Hayden Schaeffer. Towards a foundation model for partial differential equations: Multi-operator learning and extrapolation. <i>Physical Review E</i>, 111(3), 035304. <a href="https://doi.org/10.1103/PhysRevE.111.035304">https://doi.org/10.1103/PhysRevE.111.035304</a></li><li>3. Yuxuan Liu, <b>Jingmin Sun</b>, Xinjie He, Griffin Pinney, Zecheng Zhang, and Hayden Schaeffer. PROSE-FD: A Multimodal PDE Foundation Model for Learning Multiple Operators for Forecasting Fluid Dynamics, arXiv preprint arXiv:2409.09811 (2024). <i>Foundation model for science workshop at NeurIPS 2024</i></li></ol>	
PREPRINTS	<ol style="list-style-type: none"><li>1. <b>Jingmin Sun</b>, Zecheng Zhang, and Hayden Schaeffer. LeMON: Learning to Learn Multi-Operator Networks, arXiv preprint arXiv:2408.16168 (2024).</li><li>2. Yuxuan Liu, <b>Jingmin Sun</b>, and Hayden Schaeffer. BCAT: A Block Causal Transformer for PDE Foundation Models for Fluid Dynamics, arXiv preprint arXiv:2501.18972 (2025). Under review.</li></ol>	

## ON GOING PAPERS

1. **Jingmin Sun**, Zecheng Zhang, and Hayden Schaeffer. BelNet for Control Problems (in progress)
2. Xinjie He, **Jingmin Sun**, Zecheng Zhang, and Hayden Schaeffer. Efficiency and Computer Memory Enhancement of PDE-Foundation Model. (in progress)
3. Min Zhu, Kaiyuan Huang, **Jingmin Sun**, Lu Lu, Zecheng Zhang, and Hayden Schaeffer. Enhancing the Interpretability of the PDE-Foundation Model. (in progress)
4. Yanming Kang, **Jingmin Sun**, Giang Tran, Hans De Sterck, Hayden Schaeffer. Symbolic Information Analysis for PDE-foundation model. (in progress)

## PROJECTS

- Enhancing the Interpretability of the PDE-Foundation Model** 2024.06 -present  
*Work with Prof. Lu Lu's group, Prof. Zecheng Zhang and Prof. Hayden Schaeffer*
- Symbolic Information Analysis for PDE-Foundation Model** 2024.06 -present  
*Work with Prof. Giang Tran's group, Prof. Hans De Sterck and Prof. Hayden Schaeffer*
- Efficiency and Memory Enhancement of PDE-Foundation Model** 2024.06 -present  
*Work with Prof. Zecheng Zhang and Prof. Hayden Schaeffer's group*
- BelNet on Dynamical System** 2023.05 - present  
*Work with Prof. Zecheng Zhang and Prof. Hayden Schaeffer*
- Kernel Analog Forecasting with Controls** 2022.05 - 2023.05  
*Work with Prof. Rachel Ward and Prof. Hayden Schaeffer*
- On Sticky Brownian Motion and Numerical Solution** 2020.01 - 2020.05  
*Rensselaer Polytechnic Institute, work with Prof. Fengyan Li*

## TEACHING AND MENTORING

- REU Co-Mentor** | University of California, Los Angeles Summer 2024
- TA for Numerical Methods** | Carnegie Mellon University Spring, Fall 2024
- TA for Computational Linear Algebra** | Carnegie Mellon University Fall 2023
- TA for Linear Algebra for Data Science** | Carnegie Mellon University Fall 2023
- TA for Probability (Graduate Level)** | Carnegie Mellon University Spring 2023
- TA for Numerical PDEs** | Carnegie Mellon University Fall 2022
- TA for Integration and Approximation** | Carnegie Mellon University Spring 2022
- TA for Probability** | Carnegie Mellon University Fall 2021
- TA for Matrix Algebra** | Carnegie Mellon University Summer 2021
- TA for Numerical Linear Algebra** | Carnegie Mellon University Spring 2021
- TA for Principle of Analysis 1** | Carnegie Mellon University Fall 2020
- TA for Linear Algebra** | Rensselaer Polytechnic Institute Spring 2020

## AWARDS

- **Travel Award**, SIAM Conference on Mathematics of Data Science 2024.07
- **The Max Hirsch Prize**, Rensselaer Polytechnic Institute 2020.05

PRESENTATIONS    **Towards a foundation model for partial differential equations: Multi-operator learning and extrapolation**    2024.10  
*SIAM Conference on Mathematics of Data Science*

**LeMON: Learning to Learn Multi-Operator Networks**    2024.10  
*Prof. Lu Lu's Seminar at Yale University*

**PDE Foundation Model: Generalization, Meta-learning and more**    2024.09  
*Applied and Computational Math Seminar at Florida State University*

**Predicting Operators and Symbolic Expressions using Multimodal Transformers - PDE**    2024.03  
*Prof. Hayden Schaeffer's Seminar at University of California, Los Angeles*

SKILLS            **Languages:** English, Chinese (Native).

**Programming:**

- Foundation model engineering and programming (e.g. Transfer learning, meta-learning)
- High-Performance Computing (e.g., Linux/Unix, Bash, CUDA)
- Python (e.g., NumPy, PyTorch, JAX, TensorFlow, SciPy, scikit-learn)
- MATLAB
- R
- L<sup>A</sup>T<sub>E</sub>X
- Markdown
- Git/ GitHub
- HTML/ CSS