Kejun Tang

Personal Data

Position: Research Scientist, Changsha Institute for Computing and Digital Economy, Peking University
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Research Interests

tensor methods, deep generative models, scientific machine learning, uncertainty quantification, scientific computing.

Education

09/2015-12/2020: Ph.D., Computational mathematics, School of Information Science and Technology, ShanghaiTech University & Chinese Academy of Sciences
02/2019-08/2019: Visiting student, Center for Computation and Technology & Department of Mathematics at Louisiana State University
09/2011-07/2015: B.S., Computational mathematics, School of Mathematics and Information Science, YanTai University

Employment history

February, 2023 - present: Research Scientist, Changsha Institute for Computing and Digital Economy, Peking University
February, 2021 - January, 2023: Postdoctoral research associate, Peng Cheng Laboratory
October, 2019- January, 2020. NIO, Data Scientist Intern
January, 2015- March, 2015. Kingaren, Database Engineer Intern

Teaching Assistant (TA)

- Spring 2018, ShanghaiTech: Mahcine Learning (graduate)
- Spring 2016, ShanghaiTech: Probability and Statistics (undergraduate)
- Fall 2015, ShanghaiTech: Linear Algebra (undergraduate)

Publications and preprints

- Zhitao Zhu, Chuanfu Xiao, **Kejun Tang**, Jizu Huang, Chao Yang. APTT: An accuracy-preserved tensor-train method for the Boltzmann-BGK equation, arXiv, https://arxiv.org/abs/2405.12524, 2024.
- Xili Wang, **Kejun Tang** #, Jiayu Zhai, Xiaoliang Wan and Chao Yang. Deep adaptive sampling for surrogate modeling without labeled data, arXiv, https://arxiv.org/abs/2402.11283, 2024.
- **Kejun Tang***, Jiayu Zhai*, Xiaoliang Wan and Chao Yang, Adversarial Adaptive Sampling: Unify PINN and Optimal Transport for the Approximation of PDEs, https://arxiv.org/abs/2305.18702.pdf, The International Conference on Learning Representations (ICLR), 2024.
- Pengfei Yin, Guangqiang Xiao, **Kejun Tang** and Chao Yang, AONN: An adjoint-oriented neural network method for all-at-once solutions of parametric optimal control problems, SIAM Journal on Scientific Computing, 46(1): C127-C153, 2024.
- Yani Feng, **Kejun Tang**, Xiaoliang Wan, Qifeng Liao, Dimension-reduced KRnet maps for high-dimensional Bayesian inverse problems, arXiv, https://arxiv.org/pdf/2303.00573.pdf, 2023.
- **Kejun Tang**, Xiaoliang Wan and Chao Yang. DAS-PINNs: A deep adaptive sampling method for solving high-dimensional partial differential equations, Journal of Computational Physics, 476 (2023): 111868.
- Xiaoliang Wan, **Kejun Tang**. Augmented KRnet for density estimation and approximation, arXiv, https://arxiv.org/pdf/2105.12866.pdf, 2021.

- Yani Feng*, **Kejun Tang***, Lianxing He, Pingqiang Zhou and Qifeng Liao. Tensor train random projection, Computer Modeling in Engineering and Sciences, 134(2), 1195–1218, 2022.
- **Kejun Tang**, Xiaoliang Wan, and Qifeng Liao. Adaptive deep density approximation for Fokker-Planck equations, Journal of Computational Physics, 457 (2022): 111080.
- **Kejun Tang**, Qifeng Liao. Rank adaptive tensor recovery based model reduction for partial differential equations with high-dimensional random inputs, Journal of Computational Physics, 409 (2020): 109326.
- **Kejun Tang**, Xiaoliang Wan, and Qifeng Liao. Deep density estimation via invertible block-triangular mapping, Theoretical & Applied Mechanics Letters, 10 (3), 143-148, 2020.
- Ke Li*, **Kejun Tang***, Tianfan Wu, and Qifeng Liao. D3M: A deep domain decomposition method for partial differential equations, IEEE Access, 8 (2019).
- Ke Li*, **Kejun Tang***, Tianfan Wu, Jinglai Li and Qifeng Liao. A hierarchical neural hybrid method for failure probability estimation, IEEE Access, 7 (2019).

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Invited Talks

- "Deep adaptive sampling for surrogate modeling", ShanghaiTech University, Shanghai, China, April 2024.
- " Deep learning for PDEs: deep adaptive sampling and surrogate modeling", 100th Anniversary of Mathematics at Henan University, Virtual, November 2023.
- "Adversarial Adaptive Sampling: Unify PINN and Optimal Transport for the Approximation of PDEs", CSIAM-2023, Kunming, China, October 2023.
- "Deep adaptive sampling: Algorithm, Theory, and Applications", Northwestern Polytechnical University, Virtual, October 2023.
- "DAS-PINNs: A deep adaptive sampling method for solving high-dimensional partial differential equations", City University of Hong Kong (CityU), Hong Kong, China, August 2023.
- "DAS-PINNs: A deep adaptive sampling method for solving high-dimensional partial differential equations", The University of Hong Kong (HKU), Virtual, May 2023.
- "AONN: An adjoint-oriented neural network method for all-at-once solutions of parametric optimal control problems", CSIAM UQ, Yantai, China, May 2023.
- "DAS: A deep adaptive sampling method for solving partial differential equations", Shanghai Normal University, Virtual, June 2022.
- "DAS: A deep adaptive sampling method for solving partial differential equations", Young Scholars Forum, National Engineering Laboratory of Big Data Analysis and Application Technology & Chongqing Big Data Research Institute, Peking University, China, March 2022.
- "Adaptive deep density approximation for Fokker-Planck equations", Workshop of AI for computing, Shenzhen, China, July 2021.
- "Rank adaptive tensor recovery based model reduction for PDEs with high-dimensional random inputs", invited talk of uncertainty quantification and data-driven symposium at SIAM CSE 2019, Spokane, Washington, February 2019.
- "Tensor recovery for PDEs with high-dimensional random inputs", contributed talk at CSIAM, Chengdu, China, September 2018.

Grants

- Huawei AI4S - Tensor networks for partial differential equations, PI, 2024-2025.
- Natural Science Foundation of Hunan Province - Adaptive physics-constrained neural network surrogate modeling for high-dimensional parametric partial differential equations, PI, 2024-2026
- China Postdoctoral Science Foundation - Adaptive physics-constrained neural networks for high-dimensional partial differential equations, 2022M711730, PI, 2022

Awards

- Second Prize of the AI for Science Contest of Guangdong-Hong Kong-Macao Great Bay Area, 2023.
- Academic scholarship, 2016-2019.
- Best TA (Teaching Assistant) of ShanghaiTech University, 2016.

- National Endeavor Fellowship, 2014
- Second Prize of The Chinese Mathematics Competitions, 2014
- Honorable Mention of Mathematical Contest In Modeling, 2014
- Excellent Student Scholarship, 2013

Skills

Programming: Python, Matlab, TensorFlow, PyTorch ***Operating Systems:*** Linux, UNIX
Github: `https://github.com/MJfadeaway`