

Xin Yu

CONTACT INFORMATION

Kahlert School of Computing
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RESEARCH INTERESTS

My research domain centers around developing **efficient machine learning** algorithms for **less computation/carbon, less memory, less data, less bias** especially for deep learning models on resource-limited edge devices. Some topics of interest are:

Methodology: **Combinatorial optimization, Bayesian machine learning, neural network expressivity, innovative network architectures design.**

Application:

- Vision: image classification, single-view 3D modeling, and autonomous driving (SLAM)
- Language: large language modeling for language generation and zero-shot tasks
- AI for Science: data-driven methods for physical simulations (Surrogate Modeling, Operator Learning), time series learning (ODE learning, streaming tensor decomposition)

EDUCATION

The University of Utah, Salt Lake City, Utah

Ph.D. Student, Computer Science (expected graduation date: May 2024)

- Dissertation Topic: “Efficient Pruning Algorithms for Deep Neural Networks”
- Advisor: Shandian Zhe, Srikumar Ramalingam

The University of Utah, Salt Lake City, Utah

M.S., Image Analysis, May, 2018

Huazhong University of Science and Technology, Wuhan, Hubei, China

M.S., Compute Science, Jun, 2012

PUBLICATIONS (*: EQUAL CONTRIBUTION)

Good A.*, Lin J.*, Yu X.*, Sieg H., Ferguson M., Zhe S., Wieczore J., & Serra T. **Recall Distortion in Neural Network Pruning and the Undecayed Pruning Algorithm**. *Advances in Neural Information Processing Systems (NeurIPS 2022)*

Yu X.*, Serra T.*, Ramalingam S., Zhe S. **The Combinatorial Brain Surgeon: Pruning Weights That Cancel One Another in Neural Networks**. In *International Conference on Machine Learning (ICML 2022)*.

Serra T., Yu X., Kumar A., Ramalingam S. **Scaling Up Exact Neural Network Compression by ReLU Stability**. *Advances in Neural Information Processing Systems (NeurIPS 2021)*

Yu X., & Baar J, Chen S. **Joint 3D Human Shape Recovery and Pose Estimation from A Single Image with Bilayer-Graph**. in *International Conference on 3D Vision (3DV 2021)*.

Ranade S.*, Yu X.*, Kakkar K., Miraldo P., & Ramalingam S. **Mapping of Sparse 3D Data using Alternating Projection**. in *Proceedings of the Asian Conference on Computer Vision (ACCV 2020)*.

Yu X.*, Sagar C.*, Feng C., Taguchi Y., Lee T., Fernandes C., & Ramalingam S. **Vlase: Vehicle localization by aggregating semantic edges**. *International Conference on Intelligent Robots and Systems (IROS 2018)*.

Yu X., Yu Z., & Ramalingam S.(2018 June). **Learning strict identity mappings in deep residual networks.** *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR 2018)*.

Cai J., Nguyen K., Shrestha N., Good A., Tu R., **Yu X.**, & Serra T. **Getting away with more network pruning: From sparsity to geometry and linear regions.** *International Conference on Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2023)*.

Li S., **Yu X.**, Xing W., Kirby M., Narayan A., & Zhe S. **Multi-Resolution Active Learning of Fourier Neural Operators** *27th International Conference on Artificial Intelligence and Statistics(AISTATS 2024)*(to appear).

Fang S., **Yu X.**, Wang Z., Li S., Kirby R., Zhe S. **Functional Bayesian Tucker Decomposition for Continuous-indexed Tensor Data.** *Twelfth International Conference on Learning Representation(ICLR 2024)* (to appear).

Fang, S., **Yu, X.**, Li, S., Wang, Z., Kirby R., & Zhe, S. **Streaming Factor Trajectory Learning for Temporal Tensor Decomposition.** *Advances in Neural Information Processing Systems (NeurIPS 2023)* .

Li, S., Phillips, J. M., **Yu, X.**, Kirby, R., & Zhe, S. **Batch Multi-Fidelity Active Learning with Budget Constraints.** *Advances in Neural Information Processing Systems (NeurIPS 2022)*.

Paul D., Li F., Teja M., **Yu X.**, Frost R. **Compass: Spatio temporal sentiment analysis of US election what twitter says!** *in Proceedings of the 23rd ACM SIGKDD international conference on knowledge discovery and data mining (KDD 2017)*.

PREPRINTS AND
UNDER
SUBMISSIONS

Li Z., Liu S., **Yu X.**, Bhavya K., Cao J., Daniel D., Bremer P. and ascucci V. **Understanding Robustness Lottery: A Comparative Visual Analysis of Neural Network Pruning Approaches.** (*submit to (TVCG)*) [arXiv:2206.07918].

POSTERS AND
PRESENTATIONS

The Combinatorial Brain Surgeon: Pruning Weights That Cancel One Another in Neural Networks
The Mixed Integer Programming Workshop (MIPs), Rutgers University, Newark, NJ, 2022

Recall Distortion in Neural Network Pruning and the Undecayed Pruning Algorithm
Sparsity in Neural Networks(SNN) workshop, virtual, 2022

Joint 3D Human Shape Recovery and Pose Estimation from A Single Image with Bilayer-Graph
Mitsubishi Electric Research Laboratories (MERL), Cambridge, MA, 2019

Learning strict identity mappings in deep residual networks
College of Engineering, University of Idaho, Idaho Falls, ID, 2018

ACADEMIC
SERVICES

Conference Reviewer

ICLR 2024, ICML 2023, NeurIPS 2023, NeurIPS 2022, IROS 2021, ICVGIP 2021

Program Committee

ICDM Workshop 2023

TEACHING

The University of Utah*Teaching Mentorships*

- **CS6190 Probability Modeling** (Shandian Zhe) Spring 2023
- **CS6320 Computer Vision** (Tucker Hermans) Spring 2020
- **CS6320 Computer Vision** (Srikumar Ramalingam) Spring 2019
- **CS6320 Computer Vision** (Srikumar Ramalingam) Spring 2018

INDUSTRY
EXPERIENCE**Mitsubishi Electric Research Laboratories**, Boston, MA**May, 2020 - Aug, 2020***Research Intern @ Vision group*

Design and develop 3D Face and Body reconstruction.

Mitsubishi Electric Research Laboratories, Boston, MA**May, 2019 - Nov, 2019***Research Intern @ Vision group*

Design and develop 3D Human Shape Recovery from A Single Image with Bilayer-Graph.

Meituan, Beijing, China**Feb, 2015 - July, 2016***Software engineer @ Intelligent Technology Center*

Built query paraphrase system by machine translation with query logs to enhance search system.

REFERENCE

Please request reference letter from Interfolio email.

Shandian Zhe (advisor)

Assistant Professor, Kahlert School of Computing, University of Utah

50 Central Campus Drive, 3910

Phone: (219)629-1630

Email: zhe@cs.utah.edu

Interfolio Email: send.Zhe.70FFF60DD9@interfoliodossier.com

Srikumar Ramalingam (co-advisor)

Staff Research Scientist, Google Research, NYC,

Phone: (617)955-3752

Email: rsrikumar@google.com

Interfolio Email: send.Ramalingam.126645B8F1@interfoliodossier.com

Mike Kirby

Professor, School of Computing, University of Utah

72 S. Central Campus Drive, 3750 Warnock Engineering Building

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Thiago Serra

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Jeroen van Baar

Sr. Applied Scientist, Amazon Robotics

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Interfolio Email: send.Baar.834093F39D@interfoliodossier.com