

Education

Ph.D. in Applied Mathematics <i>Brown University, Advisor: Stuart Geman</i>	2012-2018
B.S. in Statistics and Probability <i>Peking University</i>	2008-2012
B.A. in Economics <i>Peking University</i>	2009-2012

Work Experiences

Staff Research Scientist, Vicarious AI	2021.10-present
Researcher, Vicarious AI	2019.7-2021.9

- *Modeling and infrastructure improvements for object detection in robotic applications.*
- *Research on inference and learning in probabilistic graphical models.*
- *Leading the design and implementation of the open source package PGMax for scalable loopy belief propagation on discrete probabilistic graphical models in JAX.*

Postdoctoral Associate, Applied Math, Brown University	2018.9-2019.6
<ul style="list-style-type: none">• <i>Semester Postdoc at ICERM Spring 2019 Semester program on Computer Vision</i>• <i>Organizer of the ICERM Generative Models Discussion Group</i>	

Applied Scientist Intern, Amazon Lab126	2017.5-2018.8
<ul style="list-style-type: none">• <i>Collaborators: Achi Brandt and Eran Borenstein, Computer Vision Team</i>• <i>Research on multiscale optimization methods for stochastic ill-conditioning in deep neural networks</i>	

Consulting for Quantitative Finance Firms

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| • <i>Consultant, Qsemble Capital Management</i> | 2018.9-2019.6 |
| • <i>Consultant, Engineers Gate</i> | 2015.8 |

Publications

- **Guangyao Zhou***, Nishanth Kumar*, Miguel Lázaro-Gredilla, Shrinu Kushagra, and Dileep George (* indicates equal contribution). PGMax: Factor Graphs for Discrete Probabilistic Graphical Models and Loopy Belief Propagation in JAX. *In preparation*, 2022
- **Guangyao Zhou**. Metropolis Augmented Hamiltonian Monte Carlo. In *Symposium on Advances in Approximate Bayesian Inference*, pages 1–10. PMLR, 2022
- **Guangyao Zhou**, Wolfgang Lechra, Antoine Dedieu, Miguel Lázaro-Gredilla, and Dileep George. Graphical Models with Attention for Context-Specific Independence and an Application to Perceptual Grouping. *arXiv preprint arXiv:2112.03371*, 2021
- Miguel Lázaro-Gredilla, Wolfgang Lechra, Nishad Gothoskar, **Guangyao Zhou**, Antoine Dedieu, and Dileep George. Query training: Learning a worse model to infer better marginals in undirected graphical models with hidden variables. *AAAI Conference on Artificial Intelligence (AAAI)*, 2021

- **Guangyao Zhou**. Mixed Hamiltonian Monte Carlo for Mixed Discrete and Continuous Variables. *Advances in Neural Information Processing Systems (NeurIPS)*, 2020
- Dileep George, Miguel Lázaro-Gredilla, Wolfgang Lech, Antoine Dedieu, and **Guangyao Zhou**. A detailed mathematical theory of thalamic and cortical microcircuits based on inference in a generative vision model. *bioRxiv 2020.09.09.290601*, 2020
- Jackson Loper*, **Guangyao Zhou***, and Stuart Geman (* indicates equal contribution). Capacities and efficient computation of first passage probabilities. *Phys. Rev. E* 102, 023304, 2020
- **Guangyao Zhou**, Jackson Loper, and Stuart Geman. Base-pair ambiguity and the kinetics of RNA folding. *BMC Bioinformatics*, 20(1):666, December 2019
- **Guangyao Zhou**, Stuart Geman, and Joachim M Buhmann. Sparse feature selection by information theory. In *2014 IEEE International Symposium on Information Theory*, pages 926–930, June 2014
- **Guangyao Zhou**, Zhiwu Lu, and Yuxin Peng. L1-graph construction using structured sparsity. *Neurocomputing*, 120:441–452, November 2013

Services

Reviewer for ICML 2020-2022, NeurIPS 2021, ICLR 2022, AISTATS 2022