Tongzhou **Wang**

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Education

Massachusetts Institute of Technology — *Cambridge, MA*

Machine Learning PhD Candidate at MIT CSAIL — *Feb. 2019 - PRESENT*

- Interests:
  - **Geometric structures of learned representations (🔷), and enabling efficient, adaptive and general agents via such representations (🤖).**
  - **Understanding leaning via learning from synthetic data (🗄).**
- Advisors: Phillip Isola and Antonio Torralba.

University of California, Berkeley — *Berkeley, CA*

B.A. in Computer Science and Statistics — *Aug. 2013 - May 2017*

- Research with Stuart Russell, Ren Ng, and Alexei Efros.

Industrial Experience

Facebook AI Research (FAIR) — *Remote*

Research Intern — *June 2021 - Dec. 2021*

- Minimal representation for model-based reinforcement learning. Paper appeared in ICML 2022.
- Host: Yuandong Tian

Facebook AI Research (FAIR) — *New York, NY*

Full-time Framework Engineer on the PyTorch Team — *Aug. 2017 - Jan. 2019*

- PyTorch core team when team size < 10.
- Linear algebra and spectral operators, deep learning layers, autograd optimization, CPU & GPU optimization, data loading, Python binding, etc.

Publications

🔷: Geometric structures of representations 🤖: Efficient and general agents 🗄: Synethtic data

Optimal Goal-Reaching Reinforcement Learning via Quasimetric Learning (🔷🤖) — *2023*

Tongzhou Wang, Antonio Torralba, Phillip Isola, Amy Zhang

Improved Representation of Asymmetrical Distances with Interval Quasimetric Embeddings (🔷) — *2022*

Tongzhou Wang, Phillip Isola

- Workshop on Symmetry and Geometry in Neural Representations at Conference on Neural Information Processing Systems 2022 [NeurReps Workshop at NeurIPS 2022] .
- Proceedings of Machine Learning Research (PMLR), Volume on Symmetry and Geometry in Neural Representations
- PyTorch Package for Quasimetric Learning Webpage OpenReview arXiv

Procedural Image Programs for Representation Learning (🗄) — *2022*

Manel Baradad, Richard Chen, Jonas Wulff, Tongzhou Wang, Rogerio Feris, Antonio Torralba, Phillip Isola

- Conference on Neural Information Processing Systems 2022 [NeurIPS 2022].
- Code & Datasets Webpage OpenReview arXiv

Denoised MDPs: Learning World Models Better Than the World Itself (🔷🤖) — *2022*

Tongzhou Wang, Simon S. Du, Antonio Torralba, Phillip Isola, Amy Zhang, Yuandong Tian

- International Conference on Machine Learning 2022 [ICML 2022].
- Code Webpage arXiv

On the Learning and Learnability of Quasimetrics (🔷🤖) — *2022*

Tongzhou Wang, Phillip Isola

- International Conference on Learning Representations 2022 [ICLR 2022].
- Code Webpage OpenReview arXiv

Dataset Distillation by Matching Training Trajectories (🗄) — *2022*

George Cazenavette, Tongzhou Wang, Antonio Torralba, Alexei A. Efros, Jun-Yan Zhu

- IEEE/CVF Conference on Computer Vision and Pattern Recognition 2022 [CVPR 2022].
- Code Webpage arXiv

Totems: Physical Objects for Verifying Visual Integrity *2022*

Jingwei Ma, Lucy Chai, Minyoung Huh, Tongzhou Wang, Ser-Nam Lim, Phillip Isola, Antonio Torralba

- European Conference on Computer Vision 2022 [ECCV 2022].
- Code Webpage arXiv

Learning to See by Looking at Noise (🗄) *2021*

Manel Baradad, Jonas Wulff, Tongzhou Wang, Phillip Isola, Antonio Torralba

- Advances in Neural Information Processing Systems 2021 [NeurIPS 2021].
- Code & Datasets Webpage arXiv

Understanding Contrastive Representation Learning through Alignment and Uniformity on the Hypersphere (🔮) *2020*

Tongzhou Wang, Phillip Isola

- International Conference on Machine Learning 2020 [ICML 2020].
- Code Webpage arXiv

Rewriting a Deep Generative Model *2020*

David Bau, Steven Liu, Tongzhou Wang, Jun-Yan Zhu, Antonio Torralba

- European Conference on Computer Vision 2020 [ECCV 2020].
- Code Webpage arXiv

Diverse Image Generation via Self-Conditioned GANs *2020*

Steven Liu, Tongzhou Wang, David Bau, Jun-Yan Zhu, Antonio Torralba

- Conference on Computer Vision and Pattern Recognition 2020 [CVPR 2020].
- Code Webpage arXiv

Dataset Distillation (🗄) *2018*

Tongzhou Wang, Jun-Yan Zhu, Antonio Torralba, Alexei A. Efros

- Code Webpage arXiv

Meta-Learning MCMC Proposals *2017*

Tongzhou Wang, Yi Wu, David A. Moore, Stuart Russell

- Advances in Neural Information Processing Systems 2018 [NeurIPS 2018].
- Oral presentation at ICML 2017 AutoML workshop.
- arXiv

Learning to Synthesize a 4D RGBD Light Field from a Single Image *2017*

Pratul Srinivasan, Tongzhou Wang, Ashwin Sreelal, Ravi Ramamoorthi, Ren Ng

- International Conference on Computer Vision 2017 [ICCV 2017].
- Code arXiv

Academic Services

Reviewer ICML 2020 (Top Reviewer), NeurIPS 2020, ICML 2021, CVPR 2021, NeurIPS 2021, ICLR 2022, ICML 2022, NeurIPS 2022.