Tongzhou Wang

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Education

Massachusetts Institute of Technology *Cambridge, MA*
MACHINE LEARNING PHD CANDIDATE AT MIT CSAIL *Feb. 2019 - PRESENT*

- Research Interests: **Structures in machine learning and artificial agents:** invariance, abstraction, distance, factorization, redundancy, *etc*.
  - ⬡ Structures **of** learned representations
  - 🤖 Structures **for** more efficient and general agents
  - 🗄 Structures **of datasets in** learning, which we analyze via structured *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.
- Scientific computing & deep learning operators, autograd optimization, CPU & GPU optimization, data loading, Python binding, etc.

Publications   ⬡ Structures of representations   🤖 Structures for better agents   🗄 Structures of datasets

Optimal Goal-Reaching Reinforcement Learning via Quasimetric Learning (⬡🤖) *2023*
TONGZHOU WANG, ANTONIO TORRALBA, PHILLIP ISOLA, AMY ZHANG

- International Conference on Machine Learning 2023 [`ICML 2023`].
- ⎘ `Webpage` `arXiv`

Generalizing Dataset Distillation via Deep Generative Prior (🗄) *2023*
GEORGE CAZENAVETTE, TONGZHOU WANG, ANTONIO TORRALBA, ALEXEI A. EFROS, JUN-YAN ZHU

- IEEE/CVF Conference on Computer Vision and Pattern Recognition 2023 [`CVPR 2023`].

Improved Representation of Asymmetrical Distances with Interval Quasimetric Embeddings (⬡) *2022*
TONGZHOU WANG, PHILLIP ISOLA

- Workshop on Symmetry and Geometry in Neural Representations at NeurIPS 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, CHUN-FU 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, <u>Tongzhou Wang</u>, Antonio Torralba, Alexei A. Efros, Jun-Yan Zhu

- IEEE/CVF Conference on Computer Vision and Pattern Recognition 2022 [`CVPR 2022`].
- ⧉ <u>Code</u> <u>Webpage</u> <u>arXiv</u>

Totems: Physical Objects for Verifying Visual Integrity

2022

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

- European Conference on Computer Vision 2022 [`ECCV 2022`].
- ⧉ <u>Code</u> <u>Webpage</u> <u>arXiv</u>

Learning to See by Looking at Noise (🛢)

2021

Manel Baradad*, Jonas Wulff*, <u>Tongzhou Wang</u>, Phillip Isola, Antonio Torralba

- Advances in Neural Information Processing Systems 2021 [`NeurIPS 2021`].
- ⧉ <u>Code & Datasets</u> <u>Webpage</u> <u>arXiv</u>

Understanding Contrastive Representation Learning through Alignment and Uniformity on the Hypersphere (⬡)

2020

<u>Tongzhou Wang</u>, Phillip Isola

- International Conference on Machine Learning 2020 [`ICML 2020`].
- ⧉ <u>Code</u> <u>Webpage</u> <u>arXiv</u>

Rewriting a Deep Generative Model (🛢)

2020

David Bau, Steven Liu, <u>Tongzhou Wang</u>, Jun-Yan Zhu, Antonio Torralba

- European Conference on Computer Vision 2020 [`ECCV 2020`].
- ⧉ <u>Code</u> <u>Webpage</u> <u>arXiv</u>

Diverse Image Generation via Self-Conditioned GANs (⬡)

2020

Steven Liu, <u>Tongzhou Wang</u>, David Bau, Jun-Yan Zhu, Antonio Torralba

- Conference on Computer Vision and Pattern Recognition 2020 [`CVPR 2020`].
- ⧉ <u>Code</u> <u>Webpage</u> <u>arXiv</u>

Dataset Distillation (🛢)

2018

<u>Tongzhou Wang</u>, Jun-Yan Zhu, Antonio Torralba, Alexei A. Efros

- ⧉ <u>Code</u> <u>Webpage</u> <u>arXiv</u>

Meta-Learning MCMC Proposals

2017

<u>Tongzhou Wang</u>, Yi Wu, David A. Moore, Stuart Russell

- Advances in Neural Information Processing Systems 2018 [`NeurIPS 2018`].
- Oral presentation at ICML 2017 AutoML workshop.
- ⧉ <u>arXiv</u>

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

2017

Pratul Srinivasan, <u>Tongzhou Wang</u>, Ashwin Sreelal, Ravi Ramamoorthi, Ren Ng

- International Conference on Computer Vision 2017 [`ICCV 2017`].
- ⧉ <u>Code</u> <u>arXiv</u>

Academic Services

Reviewer	ICML 2020 (Top Reviewer), NeurIPS 2020, ICML 2021, CVPR 2021, NeurIPS 2021, ICLR 2022, ICML 2022, NeurIPS 2022, ICML 2023, NeurIPS 2023, TMLR.
Workshop Organizer	Goal-Conditioned Reinforcement Learning (GCRL) Workshop at NeurIPS 2023.