

Wufei Ma

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EDUCATION

- Sep 2022 – **Johns Hopkins University** – Baltimore, MD
Ph.D. in Computer Science advised by Prof. Alan Yuille. GPA: 4.0/4.0.
- Sep 2021 – **Purdue University** – West Lafayette, IN
May 2022 Graduate study in Computer Science. GPA: 4.0/4.0.
- Jan 2017 – **Rensselaer Polytechnic Institute** – Troy, NY
May 2020 B.S. in Computer Science & B.S. in Mathematics
Summa Cum Laude. GPA: 3.96/4.0. Dean's Honor List in every semester.
Outstanding Performance Award \times 2.

INTERNSHIP EXPERIENCES

- Jun 2025 – **Amazon FAR (Frontier AI for Robotics)** – San Francisco, CA
Applied Scientist Intern. Supervisor: Liang-Chieh (Jay) Chen.
Visual tokenizer for scene understanding and generation.
- Nov 2024 – **Google Research** – Remote
May 2025 Student researcher. Supervisors: Shun Liao, Yanqi Zhou, Zhuoyuan Chen.
Self-supervised video pretraining.
- May 2023 – **Meta Reality Labs** – Burlingame, CA
Nov 2023 Research scientist intern. Supervisors: Kai Li, Huiyu Wang.
Video-text pretraining; evaluation of video diffusion models.
- May 2022 – **Amazon AWS AI** – Santa Clara, CA
Aug 2022 Applied scientist intern. Supervisors: Srikar Appalaraju, R Manmatha.
Visual pretraining for scene-text VQA.
- Jan 2021 – **Microsoft Research Asia (MSRA)** – Beijing, China
Aug 2021 Research intern. Supervisors: Bin Li, Jiahao Li.
Deep learning-based video compression.
- Aug 2020 – **Megvii (Face++) Research** – Beijing, China
Dec, 2020 Research intern. Supervisor: Zhikang Liu.
Monocular 3D object detection with occlusion reasoning.

AWARDS AND SCHOLARSHIPS

- 2021 “Stars of Tomorrow” Award, *Microsoft Research Asia*
- 2020 Award of Excellence, *Megvii Research*
- 2019 Outstanding Performance Award, *Prof. Lirong Xia (RPI)*
- 2018 Outstanding Performance Award, *Prof. David Goldschmidt (RPI)*
- 2015 National Undergraduate Scholarship, *Wuhan University*

PREPRINTS

- [P2] Wufei Ma^{*}, Yu-Cheng Chou^{*}, Qihao Liu^{*}, Xingrui Wang, Celso M de Melo, Jianwen Xie, and Alan Yuille. **SpatialReasoner: Towards Explicit and Generalizable 3D Spatial Reasoning**. *Under review*. 2025.

PUBLICATIONS

- [24] Wufei Ma, Haoyu Chen, Guofeng Zhang, Celso M de Melo, and Alan Yuille. **3DSRBench: A Comprehensive 3D Spatial Reasoning Benchmark**. In *International Conference on Computer Vision (ICCV)*. 2025.
- [23] Wufei Ma, Luoxin Ye, Nessa McWeeney, Celso M de Melo, Jieneng Chen, and Alan Yuille. **A Compound 3D-Informed Design toward Spatially-Intelligent Large Multimodal Models**. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. 2025. **(Highlight presentation, 3%)**.
- [22] Xingrui Wang, Wufei Ma, Tiezheng Zhang, Celso M de Melo, Jieneng Chen, and Alan Yuille. **Spatial457: A Diagnostic Benchmark for Comprehensive Spatial Reasoning of Large Multimodal Models**. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. 2025. **(Highlight presentation, 3%)**.
- [21] Weijie Guo, Guofeng Zhang, Wufei Ma, and Alan Yuille. **DINeMo: Learning Neural Mesh Models with no 3D Annotations**. In *3rd Workshop on Compositional 3D Vision at CVPR*. 2025.
- [20] Xingrui Wang, Wufei Ma, Angtian Wang, Shuo Chen, Adam Kortylewski, and Alan Yuille. **Compositional 4D Dynamics Scene Understanding with Physics Prior for Video Question Answering**. In *International Conference on Learning Representations (ICLR)*. 2025.
- [19] Wufei Ma, Guofeng Zhang, Qihao Liu, Guanning Zeng, Adam Kortylewski, Yaoyao Liu, and Alan Yuille. **ImageNet3D: Towards General-Purpose Object-Level 3D Understanding**. In *Advances in Neural Information Processing Systems (NeurIPS)*. 2024.
- [18] Wufei Ma, Kai Li, Zhongshi Jiang, Moustafa Meshry, Qihao Liu, Huiyu Wang, Christian Häne, and Alan Yuille. **Rethinking Video-Text Understanding: Retrieval from Counterfactually-Augmented Data**. In *European Conference on Computer Vision (ECCV)*. 2024. **(Strong double blind)**.
- [17] Artur Jesslen, Guofeng Zhang, Angtian Wang, Wufei Ma, Alan Yuille, and Adam Kortylewski. **NOVUM: Neural Object Volumes for Robust Object Classification**. In *European Conference on Computer Vision (ECCV)*. 2024.
- [16] Wufei Ma^{*}, Qihao Liu^{*}, Jiahao Wang^{*}, Angtian Wang, Yaoyao Liu, Adam Kortylewski, and Alan Yuille. **Generating Images with 3D Annotations Using Diffusion Models**. In *International Conference on Learning Representations (ICLR)*. 2024. **(Spotlight presentation, 5%)**.
- [15] Wufei Ma, Jiahao Li, Bin Li, and Yan Lu. **Uncertainty-Aware Deep Video Compression with Ensembles**. In *IEEE Transactions on Multimedia (TMM)*. 2024.

- [14] Bingchen Zhao, Jiahao Wang, Wufei Ma, Artur Jesslen, Siwei Yang, Shaozuo Yu, Oliver Zendel, Christian Theobalt, Alan Yuille, and Adam Kortylewski. In *IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)*. 2024.
- [13] Angtian Wang*, Wufei Ma*, Alan Yuille, and Adam Kortylewski. **Neural Textured Deformable Meshes for Robust Analysis-and-Synthesis**. In *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2023.
- [12] Jiahao Yang, Wufei Ma, Angtian Wang, Xiaoding Yuan, Adam Kortylewski, and Alan Yuille. **Robust Category-Level 3D Pose Estimation from Synthetic Data**. In *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*. 2023.
- [11] Xingrui Wang, Wufei Ma, Zhuowan Li, Adam Kortylewski, and Alan Yuille. **3D-Aware Visual Question Answering about Parts, Poses, and Occlusions**. In *Advances in Neural Information Processing Systems (NeurIPS)*. 2023.
- [10] Jiacong Xu, Yi Zhang, Jiawei Peng, Wufei Ma, ..., Alan Yuille, and Adam Kortylewski. **Animal3D: A Comprehensive Dataset of 3D Animal Pose and Shape**. In *IEEE/CVF International Conference on Computer Vision (ICCV)*. 2023.
- [9] Zhuowan Li, Xingrui Wang, Elias Stengel-Eskin, Adam Kortylewski, Wufei Ma, Benjamin Van Durme, and Alan Yuille. **SuperCLEVR: A Virtual Benchmark to Diagnose Robustness in Visual Reasoning**. In *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*. 2023. **(Highlight presentation)**.
- [8] Wufei Ma, Angtian Wang, Adam Kortylewski, and Alan Yuille. **Robust Category-Level 6D Pose Estimation with Coarse-to-Fine Rendering of Neural Features**. In *European Conference on Computer Vision (ECCV)*. 2022.
- [7] Bingchen Zhao, Shaozuo Yu, Wufei Ma, Mingxin Yu, Shengxiao Mei, Angtian Wang, Ju He, Alan Yuille, and Adam Kortylewski. **OOD-CV: A Benchmark for Robustness to Out-of-Distribution Shifts of Individual Nuisances in Natural Images**. In *European Conference on Computer Vision (ECCV)*. 2022. **(Oral presentation)**.
- [6] Xiaowei Zhang, Wufei Ma, Gunder Varinlioglu, Nick Rauh, Liu He, and Daniel Aliaga. **Guided Pluralistic Building Contour Completion**. 2022.
- [5] Farhad Mohsin, Lei Luo, Wufei Ma, Inwon Kang, Zhibing Zhao, Ao Liu, Rohit Vaish, and Lirong Xia. **Making group decisions from natural language-based preferences**. In *International Workshop on Computational Social Choice (COMSOC)*. 2021.
- [4] Arun Baskaran, Elizabeth J Kautz, Aritra Chowdhary, Wufei Ma, Bülen Yener, and Daniel Lewis. **Adoption of Image-Driven Machine Learning for Microstructure Characterization and Materials Design: A Perspective**. In *JOM, The Journal of The Minerals, Metals & Materials Society (TMS)*. 2021.
- [3] Elizabeth J Kautz, Wufei Ma, Arun Bakaran, Vineet Joshi, Bülent Yener, and Daniel Lewis. **Image-driven discriminative and generative methods for establishing microstructure-processing relationships relevant to nuclear fuel processing pipelines**. In *Microscopy and Microanalysis*. 2021.

- [2] Wufei Ma, Elizabeth J Kautz, Arun Bakaran, Aritra Chowdhary, Vineet Joshi, Bülent Yener, and Daniel Lewis. **Image-driven discriminative and generative machine learning algorithms for establishing microstructure-processing relationships**. In *Journal of Applied Physics*. 2020.
- [1] Elizabeth J Kautz, Wufei Ma, Saumyadeep Jana, Arun Devaraj, Vineet Joshi, Bülent Yener, and Daniel Lewis. **An image-driven machine learning approach to kinetic modeling of a discontinuous precipitation reaction**. In *Materials Characterization*, 2020.

PROFESSIONAL SERVICES

2021 – **Reviewer**
ICLR, NeurIPS, ICML, CVPR, ICCV, ECCV, AAAI, WACV, etc.

TEACHING EXPERIENCES

Fall 2025 **Graduate teaching assistant**, *Johns Hopkins University*
AS675 - Probabilistic Models of the Visual Cortex.

Spring 2024 **Graduate course assistant**, *Johns Hopkins University*
CS661 - Computer Vision.

Fall 2023 **Graduate course assistant**, *Johns Hopkins University*
CS661 - Computer Vision.

Spring 2023 **Graduate course assistant**, *Johns Hopkins University*
CS671 - NLP: Self-Supervised Models.

LEADERSHIP

Sep 2015 – **Captain**, *Soccer team of College of Mathematics at Wuhan University*
Nov 2016 Enter semi-final and quarter-final of WHU Soccer Champion Cup in 2015 and 2016, out of 32.

Jan 2014 – **President**, *Rubik's Cube Club at Shanghai High School*
Jan 2015 Organize tutorials, workshops, and competitions for various Rubik's Cubes.