

Chenyang (Danny) Ma

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EDUCATION

University of Oxford <i>Ph.D. in Computer Science. Focus: Human-Centered Robotic Agents, 3D Computer Vision</i>	Oct 2023 – July 2027 (Expected)
University of Cambridge <i>MPhil in Advanced Computer Science</i>	Oct 2022 – July 2023 Distinction
University of Michigan—Ann Arbor <i>B.S.E. in Computer Engineering, Minor in Mathematics</i>	Sept 2019 – May 2022 Cumulative GPA: 3.97

SELECTED PUBLICATIONS

SpatialPIN: Enhancing Spatial Reasoning Capabilities of Vision-Language Models through Prompting and Interacting 3D Priors. *NeurIPS, 2024.*

Chenyang Ma, Kai Lu, Ta-Ying Cheng, Niki Trigoni, Andrew Markham

Gradient-less Federated Gradient Boosting Tree with Learnable Learning Rates. *EuroMLSys Workshop, 2023.*

Chenyang Ma, Xinchu Qiu, Daniel Beutel, Nicholas Lane

Touch and Go: Learning from Human-Collected Vision and Touch. *NeurIPS, 2022.*

Fengyu Yang, Chenyang Ma*, Jiacheng Zhang, Jing Zhu, Wenzhen Yuan, Andrew Owens (*= Equal Contribution)*

Sparse and Complete Latent Organization for Geospatial Semantic Segmentation. *CVPR, 2022.*

Fengyu Yang, Chenyang Ma* (*= Equal Contribution)*

RESEARCH / INTERNSHIP EXPERIENCES

Research Collaborator at FAIR, Meta Inc. <i>Mentors: Xavier Puig & Ruta Desai</i>	June 2024 – Present <i>Remote / Oxford, UK</i>
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- Propose a new framework towards open-ended, continuous, and realistic human-robot collaboration
- Develop a method to simulate realistic humans within robot simulation software using LLMs and motion data
- Design an approach to align human and robot values through days of collaboration

PhD Student at CPS, University of Oxford <i>Mentors: Andrew Markham & Niki Trigoni</i>	Oct 2023 – Present <i>Oxford, UK</i>
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- First Project: Proposed SpatialPIN — a modular plug-and-play framework that progressively enhances VLM's 3D reasoning capabilities by prompting and interacting with 3D foundational models
- Second Project (ongoing): Open-ended, continuous, and realistic human-robot collaboration

Applied Scientist Intern at Roku Inc. <i>Mentor: Michael Sanders</i>	July 2024 – Oct 2024 <i>Cambridge, UK</i>
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- Investigated the problem of IoT camera package delivery detection under adversarial condition
- Framed the problem within and addressed pain points in video-based human action recognition caused by the complexity of real-world data (e.g., high variety of camera angles, backgrounds, illumination, scales, etc.)
- Developed a cost-effective hierarchical ensemble pipeline with a meta-learner to amplify human action signals and learn causal relationships between models, achieving performance ready for real-world deployment

Research Intern at Flower Labs & CaMLSys, University of Cambridge <i>Mentors: Nicholas Lane & Daniel Beutel</i>	Oct 2022 – July 2023 <i>Cambridge, UK</i>
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- Developed the first privacy-preserving framework for federated XGBoost under horizontal federated learning setting that does not depend on the sharing of gradients and Hessians, which leads to serious privacy concerns
- Proposed a novel method to transform the tree ensembles built by local clients as inputs to neural networks to learn robust learning rate strategies

- Achieved performances comparable to state-of-the-art accuracies on benchmark classification and regression datasets including a9a, cod-rna, higgs, etc.

Research Assistant at Owens Lab, University of Michigan

July 2021 – Sept 2022

Mentors: Anderw Owens & Wenzhen Yuan

Ann Arbor, US

- Established Touch and Go — a human-collected visual-tactile dataset with 4000 different real-world objects, 14 hours of videos, and 13,900 touches which enables researchers to study diverse visual-tactile learning applications beyond the robotics-centric domains. Applied our dataset on multimodal learning tasks as follows
- Learned tactile features through self-supervised learning by training a model to associate images with touch. Experiments demonstrated that learned features significantly outperform supervised ImageNet features on a robotic manipulation task, and on recognizing materials in our dataset
- Proposed and applied our dataset on novel task of tactile-driven image stylization (i.e., making the visual appearance of an object more consistent with a given tactile signal)
- Studied multimodal models for future touch prediction by predicting future frames of a touch sensor's recording given both visual and tactile signals. Experiments showed that visual information improves these predictions over touch alone

Independent Researcher at University of Michigan

Jan 2021 – Feb 2022

- Conducted research on semantic segmentation for remote sensing images by alleviating large intra-class variance in both foreground and background classes
- Constructed a sparse and complete latent structure via prototypes to tackle the above issues by designing a prototypical contrastive learning strategy and modeling all foreground and hardest background objects
- Designed a novel patch shuffle augmentation to encourage the semantic information of an object to be correlated only to the limited context within the patch that is specific to its category
- Outperformed state-of-art methods by evaluating model on iSAID dataset

ACADEMIC SERVICES

- **Reviewer:** CVPR (2023), NeurIPS Track on Datasets and Benchmarks (2022)
- **Teaching Assistant:** Machine Learning (2023), Deep Learning in Healthcare (2024)

HONORS & AWARDS

- **Summa Cum Laude**, College of Engineering, University of Michigan 2022
- **James B. Angell Scholar**, College of Engineering, University of Michigan 2021
- **Dean's List**, College of Engineering, University of Michigan 2019-2022
- **University Honors**, University of Michigan 2019-2022
- **Engineering Honors Program Alumni**, College of Engineering, University of Michigan

EXTRACURRICULAR

Diving, PADI, Professional Association of Diving Instructors

- Awarded Advanced Open Water Diver license (2016)
- Awarded Junior Open Water Diver license (2014)