

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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- Develop a method to simulate realistic humans driven by psychological traits, habits, and whole-day intentions within robot simulation platform (Habitat 3.0) using LLMs and motion data
- Propose a novel framework towards open-ended, continuous human-robot collaboration with realistically simulated humans in the loop
- Design an approach to align human and robot values through days of collaboration, enabling the robot to learn and mimic human behaviors by capturing the underlying correlations between human traits, temporal dependencies, and their corresponding intentions and tasks
- This project is intended for submission to CVPR 2025

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

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

Research Intern at Revvity Inc.

Feb 2021 – July 2021

- Researched and developed a real time patient monitoring and alert system for patients who are at risk of being diagnosed with VTE using Spotfire developed by TIBCO Software Inc.
- Extracted keywords from patients Electronic Health Records using transformer-based models to score patients by Padua, Wells, Geneva, and PESI criteria
- System was tested in Shanghai Sixth People's Hospital. Successfully spotted and saved an average of 30% of patients per month

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)