

# Chenyang (Danny) Ma

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## EDUCATION

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

## SELECTED PUBLICATIONS

**A Framework for Continual and Open-Ended Human-Robot Collaboration. *CVPR, 2025 in submission.***

*Chenyang Ma, Kai Lu, Ruta Desai\*, Xavier Puig\*, Andrew Markham\*, Niki Trigoni\* (\*= Equal Advising)*

**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.** June 2024 – Present

*Mentors: Xavier Puig & Ruta Desai* Remote / Oxford, UK

- Propose a new framework towards continual and open-ended 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 multiple days of collaboration

**PhD Student at CPS, University of Oxford** Oct 2023 – Present

*Mentors: Andrew Markham & Niki Trigoni* Oxford, UK

- 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): Continual and open-ended human-robot collaboration

**Applied Scientist Intern at Roku Inc.** July 2024 – Oct 2024

*Mentor: Michael Sanders* Cambridge, UK

- 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** Oct 2022 – July 2023

*Mentors: Nicholas Lane & Daniel Beutel* Cambridge, UK

- 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

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

#### HONORS & AWARDS

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| • <b>Summa Cum Laude</b> , College of Engineering, University of Michigan                   | 2022      |
| • <b>James B. Angell Scholar</b> , College of Engineering, University of Michigan           | 2021      |
| • <b>Dean's List</b> , College of Engineering, University of Michigan                       | 2019-2022 |
| • <b>University Honors</b> , University of Michigan   | 2019-2022 |
| • <b>Engineering Honors Program Alumni</b> , College of Engineering, University of Michigan |           |

#### EXTRACURRICULAR

##### Diving, PADI, Professional Association of Diving Instructors

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