Catherine Tong

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Education

DPhil in Computer Science, University of Oxford

2017 – Present

- Supervisor: Dr. Nicholas D. Lane
- Thesis: Rethinking Human Activity Recognition from Wearable Sensors
- Research Interests: activity recognition, ubiquitous sensing, ML for health, multi-modal learning
- Google Generation Scholar 2021

Masters of Physics, University of Oxford

2013 – 2017

First Class Honours

- Focus: Theoretical Physics and Atmospheric Physics
- Thesis: Diffusing Workers in a Multiplex World

Journal and Conference Papers

2021 **Catherine Tong***, Jinchen Ge* and Nicholas D. Lane. Zero-Shot Learning for IMU-Based Activity Recognition Using Video Embeddings. Accepted pending minor revisions, *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) Vol. 5 (4).*

2020 Hyeokhyen Kwon*, **Catherine Tong***, Harish Haresamudram, Yan Gao, Gregory D. Abowd, Nicholas D. Lane, and Thomas Plötz. IMUTube: Automatic Extraction of Virtual on-body Accelerometry from Video for Human Activity Recognition. In *IMWUT Vol. 4 (3).*

2020 Christian Schroeder de Witt*, **Catherine Tong***, Valentina Zantedeschi, Daniele De Martini, Alfredo Kalaitzis, Matthew Chantry, Duncan Watson-Parris and Piotr Biliski. RainBench: Towards Data-Driven Global Precipitation Forecasting from Satellite Imagery. In *AAAI '21 Vol. 35 (17).*

2019 **Catherine Tong**, Matthew Craner, Matthieu Vegreville, and Nicholas D. Lane. Tracking Fatigue and Health State in Multiple Sclerosis Patients Using Connected Wellness Devices. In *IMWUT Vol. 3 (3).*

2018 Valentin Radu, **Catherine Tong**, Sourav Bhattacharya, Nicholas D. Lane, Cecilia Mascolo, Mahesh K. Marina, and Fahim Kawsar. Multimodal Deep Learning for Activity and Context Recognition. In *IMWUT Vol. 1 (4)*

2018 Vincent WS. Tseng, Sourav Bhattacharya, Javier Fernández Marqués, Milad Alizadeh, **Catherine Tong**, and Nicholas D. Lane. Deterministic Binary Filters for Convolutional Neural Networks. In *IJCAI '18*.

**Equal Contributions*

Workshop Papers, Posters and Magazine Articles

2021 Hyeokhyen Kwon*, **Catherine Tong***, Harish Haresamudram, Yan Gao, Gregory D. Abowd, Nicholas D. Lane, and Thomas Plötz. Can You See It? Good, So We Can Sense It! In *GetMobile Vol. 25 (2).*

2021 **Catherine Tong***, Emma Rocheteau*, Petar Veličković, Nicholas D. Lane and Pietro Liò. Predicting Patient Outcomes with Graph Representation Learning. In *International Workshop on Health Intelligence (W3PHIAI '21), held with AAAI '21.* ***Best Short Paper Runner-up Award.***

2020 Valentina Zantedeschi, Daniele De Martini, **Catherine Tong**, Christian Schroeder de Witt, Alfredo Kalaitzis, Matthew Chantry, Duncan Watson-Parris and Piotr Biliski. Towards Data-Driven Physics-Informed Global Precipitation Forecasting from Satellite Imagery. In *AI for Earth Sciences Workshop, held with NeurIPS '20.*

2020 **Catherine Tong***, Christian Schroeder de Witt*, Valentina Zantedeschi, Daniele De Martini, Alfredo Kalaitzis, Matthew Chantry, Duncan Watson-Parris and Piotr Biliski. RainBench: Enabling Data-Driven Precipitation Forecasting on a Global Scale. In *Tackling Climate Change with Machine Learning Workshop, held with NeurIPS '20.*

2020 **Catherine Tong**, Shyam A. Tailor, and Nicholas D. Lane. Are Accelerometers for Activity Recognition a Dead-end? In *HotMobile '20*.

2018 **Catherine Tong**, Gabriella M. Harrari, Angela Chieh, Otmane Bellahsen, Matthieu Vegreville, Eva Roitmann and Nicholas D. Lane. Poster: Inference of Big-Five Personality Using Large-scale Networked Mobile and Appliance Data. In *MobiSys '18*.

Patent

2021 Method And System For Automatic Extraction Of Virtual On-Body Inertial Measurement Units. Filed: September 2021. Patent Application: 17/464,488.

Book Chapter

2021 (In Preparation) **Catherine Tong** and Nicholas D. Lane. Beyond the Smartphone: The Internet of Things as Sensors of Psychology and Human Behaviours. To appear in *Mobile Sensing in Psychology: Methods and Applications.*

Industry Experience

Frontier Development Lab Jun – Aug 2020
Machine Learning Researcher, Digital Twin Earth Team Remote

- Focus: Enabling global medium-range precipitation forecasts from satellite imagery.
- We developed a novel multi-modal system which incorporates physical understanding into a deep learning approach for skillful forecasts across the globe.

Microsoft Research Jun – Sep 2019
Research Intern, Manager: Dr. Danielle Belgrave Cambridge, UK

- Focus: Understanding behaviours of mental health patients on an online Cognitive Behavioural Therapy platform.
- I was part of Project Talia in the Healthcare Intelligence group. We developed a deep learning framework to analyze and predict health outcomes (as measured by depression scores) by modelling patients' browsing trajectories and relevant site content.

Nokia Bell Labs Jun – Sep 2017
Research Intern, Manager: Dr. Nic Lane Cambridge, UK

- Focus: Analyzing multi-modal deep learning models for activity and context recognition.
- We compared the performance of different multi-modal setups. We also trained machine learning models to analyze health-related data collected by smart appliances in the *Withings* range.

Centre for Agent-Based Dynamic Networks, University of Oxford May – Jul 2017
Research Assistant, Manager: Dr. Omar Guerrero Oxford, UK

- Focus: Modelling the labour economy using methods from Statistical Physics.
- We formulated and solved an agent-based Markov model on multiplex networks to describe the movement of labour across the economy. We analyzed the approach on UK labour survey data.

Other Experience

Co-Founder, GirlsWhoML Since March 2020

- I co-founded GirlsWhoML to improve gender diversity in the field of machine learning and AI. GirlsWhoML have so far delivered online Machine Learning introductory workshops to 100+ university and high-school students.
- My role includes long-term planning for the organization, designing workshop content and liaising with volunteers and industry partners.

President, Oxford Women in Computer Science Aug 2020 – 2021

- I oversee the workings of the society – I work with the committee to organize outreach, academic and industry events, liaise with University departments and external sponsors, and represent the society in general.

Teaching

2020-21 Master Thesis Project Supervision, University of Cambridge

2019-20 Teaching Assistant, Fundamentals of Sensing, University of Oxford

Other Services

2021 Session Co-Chair, MobiUK ’21

2019-21 Membership Co-Chair, N2Women Board

2017-21 Committee, Oxford Women in Computer Science

2014-17 Undergraduate Mentor, Oxford Women in Physics

2014-15 Volunteer Home-Visit Tutor, Jacari Oxford

Awards

2021 Google Generation Scholarship

2021 Best Short Paper Runner-Up, W3PHIAI ’21

2020 Best Presentation, Judges Award Nominations, UbiComp ’20

2020 ACM Student Travel Award, HotMobile ’20

2018 ACM Student Travel Award, UbiComp ’18

2017 EPSRC DPhil (PhD) Scholarship

2016 Examiners’ Commendation for Best Practical Work in Physics

2013-17 College Scholarship for Outstanding Performance in Physics Exams