Catherine Tong

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Research Interests

Areas: ubiquitous health monitoring, machine learning on graphs, embedding learning of large datasets, multimodal learning.

My current research focuses on developing machine learning models useful for health data analysis. I am interested in using ubiquitous sensing to find connections between people's daily behaviour and health outcomes. In particular, I seek to develop methods which can leverage other resources, including large-scale health records, multimodal sensor streams and graphs (e.g. knowledge graphs and social networks), to overcome the poor data scenarios often resulted from in-the-wild data collection.

Education

Computer Science, University of Oxford — 2017 - 2021 (expected)

Doctor of Philosophy (DPhil), Machine Learning with Healthcare Applications

- Research interests: Machine Learning on graphs, Transfer Learning, Ubiqutous Health monitoring
- Supervised by Associate Prof. Nicholas D. Lane

Physics, University of Oxford — 2013 - 2017

Master of Physics, First Class Honours

- Major Options: Theoretical Physics, Atmospheric Physics
- Thesis: *Labour Flows on Multiplex Networks*
- Other project: *Photometric and Evolutionary Analysis of Eclipsing Binary RCMa*

Awards

Travel Award by the ACM Special Interest Group on Computer-Human Interaction (SIGCHI)	2018
Examiners' Commendation for Best Practical Work in Physics	2016
College Scholarship for Outstanding Performance in Physics Exams	2013-2017

Publications

[Under Review] **Tracking Fatigue and Health State in Multiple Sclerosis Patients Using Ubiquitous Sensing. C. Tong**, M. Craner, A. Chieh, O. Bellahsen, M. Vegreville, E. Roitmann, ND. Lane, 2018.

Poster: Inference of Big-Five Personality Using Large-scale Networked Mobile and Appliance Data. C. Tong, GM. Harrari, A. Chieh, O. Bellahsen, M. Vegreville, E. Roitmann, ND. Lane, 2018. *The 15th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys '18)*

Deterministic Binary Filters for Convolutional Neural Networks. V. Tseng, S. Bhattacharya, J. Fernández Marqués, M. Alizadeh, **C. Tong**, ND. Lane, 2018. *The 27th International Joint Conference on Artificial Intelligence (IJCAI '18)*

Multimodal Deep Learning for Activity and Context Recognition. V. Radu, **C. Tong**, S. Bhattacharya, ND. Lane, C. Mascolo, MK. Marina, F. Kawsar, 2017. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), Volume 1 Issue 4.* Also in *Ubicomp '18* and *MobiUK '18.*

Diffusing Workers in a Multiplex World. C. Tong, O. Guerrero, E. Lopez, F. Reed-Tsochas, 2017. *Preprint at SSRN:3056730.*

Work Experience

Nokia Bell Labs, Research Assistant — Cambridge, 06-09/2017

- Trained neural networks for analyzing daily human behavioural data collected with smart mobile and home appliances;
- Analyzed the use of different multimodal deep learning models for activity and context recognition.

University of Oxford, Research Assistant — Oxford, 06-09/2016

Saïd Business School | Centre for Complex Agent-Based Dynamic Networks (CABDyN)

- Formulated and solved a Markov model on multiplex networks to describe the movement of labour across the economy;
- Data analysis and model implementation on UK labour survey data.

Mercer, Consultant Intern — London, 06-08/2015

- Analysis of employee insurance benefits of multinational companies

Poba Software, Project Management Intern — Beijing, 06-07/2014

- Supported in the conception and control of an Office Automation System project

Selected Activities

Seminar Coordinator at Oxford Women in Computer Science Society	2017 - present
Co-organizer of the 1st Oxford Emerging Tech Party	2018
Mentor at the Oxford Women in Physics Society	2014 -2017
Volunteer Tutor at Jacari (providing free home tutoring to children)	2014-2015
Private Tutor in Mathematics and Physics	2011 - present

Academic References

Nic Lane (nicholas.lane@cs.ox.ac.uk)
Associate Professor, Computer Science, University of Oxford

Eduardo Lopez (elopez22@gmu.edu)
Assistant Professor, Computational and Data Sciences, George Mason University

Joseph Conlon (joseph.conlon@physics.ox.ac.uk)
Professor, Theoretical Physics, University of Oxford