Catherine Tong

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Research Interests

Areas: ubiquitous health monitoring, machine learning on graphs, multimodal learning. My current research focuses on developing machine learning methods for modelling complex human behaviours and problems in healthcare. I am particular interested in developing versatile and robust methods which can leverage graphs, multi-modalities, and domain knowledge.

Education

Computer Science, University of Oxford — 2017 - 2021 (expected)
Doctor of Philosophy (DPhil), Machine Learning with Healthcare Applications
- 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] **Topology Matters: Understanding How Network Topological Features Impact Graph Neural Networks. C. Tong**, V. Kothari, ND. Lane, 2019.

[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, 07-09/2017

- 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, 05-07/2017

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

- Formulated and solved an agent-based 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 for multinational companies.

Selected Activities

Membership Co-chair, N2Women Board	2019 - present
Organizer, Oxford Women in CS Distinguished Speakers Seminar Series,	2017 - present
Co-organizer, the 1st Oxford Emerging Tech Party	2018
Undergraduate Mentor, Oxford Women in Physics Society	2014 -2017
Volunteer Tutor, Jacari (providing free home tutoring to children)	2014-2015
Private Tutor in Mathematics and Physics	2011 - present

Relevant Skills

- Proficient in Python, TensorFlow, LaTeX, git
- Experienced in Matlab, SQL, Keras, vim

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