Suyi Zhang

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Experience

2019-present **Research Associate** at University of Cambridge
Computational and Biological Learning Lab, Department of Engineering
- Translate PhD research to develop prototype device for pain therapeutics
- Develop software for real-time EEG signal analysis and neurofeedback training
- Create assessments for treatment effects based on human pain neuroscience

2018 **Machine Learning Intern** at Cambridge Cancer Genomics, Cambridge
- Built machine learning pipeline for cancer detection with DNA sequencing data

2018 **Data Science Intern** at HSBC, Global Markets, London
- Analysed past currency trading data to build predictive pricing model

2013-2014 **Research Assistant** at Center for Information and Neural Networks, Osaka, Japan
- Wrote code to execute experiment and control equipment
- Managed lab equipment and participant recruitment

Education

2014-2018 **PhD** in Engineering (Computational Neuroscience)
University of Cambridge, Computational and Biological Learning Lab & Peterhouse
- Thesis: Encoding and decoding of pain relief in the human brain
- For my PhD, I studied how humans learn and adapt to pain and relief. I modelled brain imaging and physiological data with learning algorithms, and demonstrated:
  1) Uncertainty has an important role in the control of learning during pain, it can flexibly modulate pain to maximise the impact of learning,
  2) The brain region pgACC is essential in both processes, suggesting its potential as a therapeutic target for pain in approaches such as neurofeedback.
- Part IIB courses: Computational Neuroscience (85%), Machine Learning (78%)

2011-2012 **MSc** in Biomedical Engineering [Distinction]
University of Oxford, St John's College
• Project: Developing automatic classifier of pain scores from human LFP recordings

2008-2011 **BEng** (Hons) in Biomedical Engineering [First Class]
University of Sheffield

2008 International Foundation Year, Guangzhou, China
A Level equivalents: 3 A* (Maths, Further Maths, Physics)

Grants and Awards

2019	Symposium International Travel Award [3 in total]	TRIBS, Fudan University
	Industry Engagement Fund [£5k grant]	University of Cambridge
	Impulse Tech Entrepreneurship Program scholarship	EPOC Cambridge
2018	Wellcome Trust Developing Concept Fund [£30k grant]	Wellcome Trust
	Judge Business School EnterpriseTECH bursary	Cambridge JBS
	Open Data Science Conference Scholarship	ODSC
2016	Trainee Financial Aid Award [top 5%]	World Congress on Pain
2014-2018	W. D. Armstrong Studentship [2 per year]	University of Cambridge
	Cambridge Trust Scholarship	
2012	Sloane Robinson Scholarship [1 in class of 20]	University of Oxford
2011	Sheffield Graduate Award	University of Sheffield
2008-2011	Sheffield Undergraduate International Merit Scholarship [3 per year]	

Publications

2019 **Zhang S, Yoshida W, Mano H, Yanagisawa T, Shibata K, Kawato M, & Seymour B.** Cognitive Control of Brain-Machine Interfaces for pain. (currently in revision)

2018 **Harries L, Zhang S, Shawe J, Sinai J, Patel N, Cassidy JW, Taylor B & Clifford HW.** Interlacing Personal and Reference Genomes for Machine Learning Disease-Variant Detection. *NeurIPS Machine Learning for Health Workshop*

2018 **Zhang S, Mano H, Lee M, Yoshida W, Robbins T, Kawato M & Seymour B.** The Control of Tonic Pain by Active Relief Learning. *eLife 7, e31949.*

2016 **Zhang S, Mano H, Ganesh G, Robbins T & Seymour B.** Dissociable Learning Processes Underlie Human Pain Conditioning. *Current Biology, 26:52–8.*

2014 **Zhang S, Seymour B.** Technology for Chronic Pain. *Current Biology 2014;24:R930–5.*

2013 **Zhang S, Green A, Smith PP.** An automatic classifier of pain scores in chronic pain patients from local field potentials recordings. *6th International IEEE/EMBS Conference on Neural Engineering (NER), pp 1194-1197*

Relevant Experience / Skills

Programming
- Python (data science: pandas, numpy, scipy; machine learning: sklearn, pytorch, fastai; visualisation: matplotlib, seaborn; web application: Dash, plotly)
- MATLAB (model fitting/comparison, data acquisition, machine learning)
- Project management: Git, Jupyter notebook, Anaconda, Sphinx
- Cloud computing: AWS, Microsoft Azure, Linux shell, PowerShell, Docker
- Typesetting & design: Latex, Microsoft Office, Inkscape

Entrepreneurship
- Had business training at Impulse (Maxwell Centre) and EnterpriseTECH (Cambridge Judge Business School) with full program scholarships
- Participated in pitch events at multiple start-up competitions
- Wrote and edited for Cambridge University science magazine *BlueSci*

Human brain imaging experiments
- Human physiological/behavioural data collection, cleaning, and modelling
- Designed fMRI / EEG experiments to study human learning and decision making
- Programmed experimental tasks (OpenCV, Psychtoolbox, Cogent)
- Pain stimulation systems scripting (Medoc Pathway, Digitimer)
- Image processing and modelling (SPM, MNE, BIDS format, fmriprep, Nilearn)
- Real-time activation/connectivity-based decoding of fMRI images and EEG signals for decoded neurofeedback

Languages Cantonese, Mandarin, English (Fluent); Japanese, Norwegian (Basics)

Talks and conferences

2019 International Symposium on Translational Research in Brain Stimulation (TRIBS)
Invited talk: BMI for pain enhances endogenous modulation of experienced pain
Pain in Europe congress (EFIC) The European Pain Federation
Invited talk: The Reinforcement Learning Model of Pain

2018 Open Data Science Conference Europe, BioMedEng2018 (Neurotechnology)

2017 Annual meeting of Society for Neuroscience (SfN)

2016 World Congress on Pain (IASP)

2015 Pain in Europe congress (EFIC) The European Pain Federation

2013 Computational Neuroscience Summer Course OIST, Japan

Journal reviewer Human Brain Mapping, IEEE Access