

HANG YUAN

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EDUCATION

DPhil in Machine Learning for Health, **University of Oxford** 2019-2023

- Advisors: Prof. Aiden Doherty and Prof. Simon Kyle
- Thesis: “Using Machine Learning for Wearables to Understand the Association of Sleep with Future Morbidity”
- EPSRC Centre for Doctoral Training in Health Data Science
- Fully funded by Novo Nordisk

MPhil in Computational Neuroscience, **École Polytechnique Fédérale de Lausanne (EPFL)** 2017-2019

- Advisors: Dr. Mathieu Salzmann and Prof. François Fleuret
- Thesis: “A Primer on the Delayed Adversarial Attack in Using Recurrent Neural Networks for Reinforcement Learning”

B.S. in Computer Science, **Jacobs University Bremen** 2014-2017

- Advisors: Prof. Herbert Jaeger and Prof. Ben Godde
- Thesis: “Resting State EEG Classification for Motor Learning Skills Using Echo State Networks”

Exchange Semester, School of Computer Science, **Carnegie Mellon University** Fall, 2016

RESEARCH EXPERIENCE

Visual Geometry Group, University of Oxford Summer 2020

Advisors: Prof. Andrew Zisserman and Dr. Timor Kadir
- Challenges of information extraction from clinical reports for machine learning

G lab, EPFL 2017-2018

Advisor: Prof. Grégoire Courtine
- Biologically plausible multilayer perceptron

Empirical Inference Group, Max Planck Institute for Intelligent Systems, Tübingen Summer 2017

Advisor: Prof. Moritz Grosse-Wentrup
- Transfer learning in brain computer interfaces

Data Science Institute, Imperial College London Summer 2016

Advisors: Dr. David Birch and Prof. Yike Guo
- Data visualisation for big data

KWARC Research Group, Jacobs University Bremen 2015-2016

Advisor: Prof. Michael Kohlhase
- Mathematical knowledge management systems

INDUSTRY EXPERIENCE

Advisor, **Lume Health**, San Francisco, USA 2023 - present

- Building next generation wearable sensors using body fluids to improve human health

Machine learning intern, **Meta (Facebook)**, London, UK Summer 2022

- AI Creative for image segmentation

Software engineering intern, **Bloomberg L.P.**, London, UK Summer 2018

- Trading simulation for fixed-income transactions
- Selected as one of the high performance interns (3/40+) featured in a public relations campaign

PUBLICATIONS

- 2024 **Yuan, H.***, Chan, S.*, Creagh, A. P., Tong, C., Acquah, A., Clifton, D. A., and Doherty, A. “Self-supervised Learning for Human Activity Recognition Using 700,000 Person-days of Wearable Data”. npj Digital Medicine.
- 2024 **Yuan, H.**, Plekhanova, T., Walmsley, R., Reynold, A., Maddison, K., Bucanc, M., Gehrman, P., Rowlands, A., Ray, D., Bennett, D., McVeigh, J., Straker, L., Eastwood, P., Kyle, S., Doherty, A. “Self-supervised learning of accelerometer data provides new insights for sleep and its association with mortality”. npj Digital Medicine
- 2024 **Yuan, H.**, Hill, L., Kypreos, D. S., and Doherty, A. “How accurate is wrist-worn accelerometry in measuring sleep stages? - a systematic review”. Journal of Sleep Research
- 2024 Creagh, A.P., Hamy, V., **Yuan, H.**, Mertes, G., Tomlinson, R., Chen, W.H., Williams, R., Llop, C., Yee, C., Duh, M.S. and Doherty, A., Garcia-Gancedo L., and Clifton, D. A. “Digital health technologies and machine learning augment patient reported outcomes to remotely characterise rheumatoid arthritis”. npj Digital Medicine.
- 2024 Wei, J., Uppal, A., Nganjimi, C., Warr, H., Ibrahim, Y., Gu, Q., **Yuan, H.**, Jones, N., Walker, A. S., & Eyre, D. W. “An electronic health records study comparing amoxicillin and co-amoxiclav for treatment of community-acquired pneumonia in Oxfordshire, UK”. *Journal of Infection (in press)*
- 2024 Chan, S., **Yuan, H.**, Tong, C., Acquah, A., Schonfeldt, S., Gershuny, J., Doherty, A. “CAPTURE-24: A large dataset of wrist-worn activity tracker data collected in the wild for human activity recognition”. arXiv.
- 2023 Ovalle, A., Subramonian, A., Singh, A., Voelcker, C., Sutherland, D.J., Locatelli, D., Breznik, E., Klubička, F., **Yuan, H.**, Zhang, H. and Shriram, J., et al. 2023. **Queer In AI: A Case Study in Community-Led Participatory AI. Best paper award** at the ACM Conference on Fairness, Accountability, and Transparency.
- 2020 **Yuan H*.**, Vanea C*, Lucivero F. and Hallowell N. “Training Ethically Responsible AI Researchers: a Case Study”. in navigating the broader impacts of AI research workshop at NeurIPS.
- 2020 Lucivero, F., Samuel, G., Blair, G., Darby, S.J., Fawcett, T., Hazas, M., Ten Holter, C., Jirotko, M., Parker, M., Webb, H. and **Yuan, H.** “Data-driven unsustainability? An interdisciplinary perspective on governing the environmental impacts of a data-driven society.
- 2016 Iancu, M., Kohlhase, M., Rabe, F., and **Yuan, H.** “Mixing surface languages for OMDoc.”

Work in progress papers

- 2024 McGagh, D., Song, K., **Yuan, H.**, Creagh, A., Fenton, S., Small, S., Ng, W., Goldsack, J., Dixon, W., Doherty, A., Coates, L. “Digital health technologies to strengthen patient-centred outcome assessment in clinical trials in inflammatory arthritis.” Under review at Lancet Rheumatology
- 2024 **Yuan, H.**, Doherty, A. “Multi-scale representation learning for wearable devices.”

Book chapters

- 2020 Ding, Z., Huang, Y., **Yuan, H.**, and Dong, H. “Introduction to reinforcement learning”. In Deep reinforcement learning (pp. 47-123). Springer, Singapore.
- **Top 1 best-selling AI textbook** on JD.com, February, 2021.
- Sold over **28,000** copies in mainland China.
- 2018 Dong, H., Zhang, J., **Yuan, H.** “Introduction to Deep Learning”. In Deep Learning using TensorFlow. Publishing House of Electronics Industry, Beijing.

Open Source Software

- 2023 Author: github.com/OxWearables/asleep
- 10 Stars | 0 Forks
- A sleep classification package for wearable sensor data using machine learning.
- 2022 Author: github.com/OxWearables/ssl-wearables
- 54 Stars | 15 Forks
- **The first open source large-scale foundation model for wearable devices.**
- 2020 Contributor: github.com/OxWearables/biobankAccelerometerAnalysis
- 157 Stars | 54 Forks
- An analytics package for data cleaning, processing and summarising accelerometer data.

AWARDS

- 2023 NDPH Early Career Research Fellowship (two year salary and 5,000 GBP budget)
- 2021 Best poster award, EPSRC Centre for Doctoral Training in Health Data Science symposium | University of Oxford
- 2017 Finalist top 6/300+ (2%) and Artificial Intelligence Track Winner | Hack Junction, the largest Hackathon in Europe, Helsinki, Finland
- 2017 Prix Du Public Hackathon by Vaudoise | Lausanne, Switzerland
- 2016 Second Place 2/20+ (10%) @ OpenBank Hackathon | Google London Campus
- 2016 Wiki Data Prize @ HPI Machine Learning and Data Analytics Hackathon | Berlin, Germany
- 2016 Promos Scholar, 1,900 euros awarded to study at Carnegie Mellon University | Bremen, Germany
- 2016 Erasmus traineeship for summer research at Imperial College | Bremen, Germany
- 2015 Top 10/130+ (8%) @ Global Jacobs Startup Competition | Bremen, Germany
- 2014 Jacobs University Entrance Scholarship 15,000 Euros | Bremen, Germany
- 2014 STEM Scholar, top 2/20+ for FRC Robotics Team 4415 | California, USA
- 2014 Daniel Award for International Student Leadership (1/100+) | California, USA

TALKS

Invited talks

- 2024 CDT-HDS Seminar: *Representation learning for genomic discovery.*
- 2023 Third Richard Doll Prospective Cohort Studies Symposium, University of Oxford: *Device measured sleep and all-cause mortality.*
- 2023 Oxford Sleep and Light Initiative, St. Hilda College, University of Oxford: *Towards population inference for light and sleep in large health datasets: a wearable perspective.*
- 2023 Phenome Seminar, Big Data Institute, University of Oxford: *Time-series machine learning of wearable sleep datasets.*
- 2023 Oxford Centre for Human Brain Activity Analysis Group, Wellcome Centre for Integrative Neuroimaging, University of Oxford: *Machine learning for time series using mobile sensing data.*
- 2022 Colby College, Virtual: *Self-supervised learning for wearables.*
- 2021 ML4Health, NeurIPS, Virtual: junior chair for round table in machine learning for population health.
- 2019 Executive International, Lausanne, Switzerland: *Artificial intelligence demystified: basic ingredients, challenges and impact on tomorrow's education.*

Contributed talks

- 2023 World Sleep Congress, Rio de Janeiro, Brazil: *Self-supervised learning yields insights into sleep and all-cause mortality.*
- 2023 5th MobiUK Research Symposium, Lancaster University: *Self-supervised learning for human activity recognition using 700,000 person-days of wearable data.*
- 2021 OXSTATS: *Machine learning for population health - a wearable perspective.*
- 2021 CDT Symposium, Trinity College, University of Oxford: *Understanding sleep's association with cardiovascular diseases using machine learning for wearables.*
- 2021 European Insomnia Network, Virtual: *Predicting polysomnography from accelerometry using machine learning.*

TEACHING & SUPERVISION

University of Oxford

- 2020-2023 Lecturer & Tutor, CDT for Health Data Science: Wearables, Self-supervised Learning, and Data Challenge
- 2023 Lecturer & Tutor, Reproducible Machine Learning of Wearables in Health Data Science Short Course: Machine Learning and Sleep Measurement
- 2021 Tutor, Department of Computer Science, Machine Learning
- 2020 Tutor, Department of Computer Science, Artificial Intelligence

Jacobs University Bremen

- 2017 Teaching assistant, Formal Language and Logic
- 2016 Teaching assistant, Statistical Inference and Data Analysis

Miscellaneous

- 2019 Tutor, Robotics Camp, TechX Academy, Shanghai, China
- 2019 Tutor, Cybersecurity Weekend, Google Zurich
- 2018-2019 Lecturer, Cybersecurity Camp, International School of Geneva

PROFESSIONAL SERVICES

Academic service

Workshop reviewer

- NeurIPS, Machine Learning for Health Workshop, : 2020, 2021, 2022
- NeurIPS, Machine Learning Time Series for Health Workshop: 2023
- AAAI Human-centric Representation Learning Workshop: 2024
- ICLR Learning Time-series for Health: 2024

Journal reviewer

- Nature Communications: 1
- Communications Medicine: 1
- Journal of Open Source Software: 1
- Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT): 1

Diversity, equity, and inclusion (DE & I)

2020-2023 Mentor for Queer in AI, Women in AI, and Jacobs University Bremen Alumni Mentorship Program

2022 Program committee member: Queer in AI Workshop, NeurIPS

2021-2022 Program committee member: DE & I CDT for Health Data Science