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

Journal articles

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*. | GitHub 70 stars | 16 forks
- **The first open source large-scale foundation model for wearable devices**

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*. | GitHub 10 stars | 4 forks

2024 **Yuan, H.**, Hill, L., Kype D S., and Doherty, A. "How accurate is wrist-worn accelerometry in measuring sleep stages? - a systematic review". *Journal of Sleep Research*.

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." *Lancet Rheumatology*

2024 Rapaport, P., Amador, S., Adeleke, M. O., Barber, J. A., Banerjee, S., Charlesworth, G., Clarke, C., Espie, C. A., Gonzalez, L., Horsley, R., Hunter, R., Kyle, S. D., Manela, M., Raczek, M., Walker, Z., Webster, L., **Yuan, H.**, Livingston, G. "Clinical-effectiveness of DREAMS START (Dementia RElAted Manual for Sleep; STrAtegies for RelaTives) versus usual care for people with dementia and their carers: A single masked, phase 3, parallel arm, superiority randomised controlled trial." *Lancet Healthy Longevity*

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 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". *Scientific Data*.

2024 Wei, J., Uppal, A., Nganjimi, C., Warr, H., Ibrahim, Y., Gu, Q., **Yuan, H.**, Jones, N., Walker, A. S., & Eyre, D. W. "No evidence of difference in mortality with amoxicillin versus co-amoxiclav for hospital treatment of community-acquired pneumonia". *Journal of Infection*

Conference proceedings and pre-prints

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 (ACM FAccT)*.

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*.

Work in progress

2025 **Yuan** et al."Contrastive accelerometer language pre-training"

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 TensorLayer. Publishing House of Electronics Industry, Beijing.

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

Upcoming Great Orchard Street Hospital, London: *Wearable based longitudinal monitoring in routine care*.

2024 Novo Nordisk: *Foundation Models for Wearables*.

2024 Understanding Human Skill in Healthcare Settings by AI-based Analysis, Worcester College, University of Oxford: *Wearables, the window into high-performance healthcare systems*.

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 services

Academic leadership

2021-2024 Committee member for Oxford Network for Medical Statisticians

2022 Committee member for Queer in AI Workshop at NeurIPS

2021 Junior chair for ML4Health Workshop at NeurIPS

Conference reviewer

2024 NeurIPS

2024 AAAI Human-centric Representation Learning Workshop

2024 ICLR Learning Time-series for Health

2023 NeurIPS, Machine Learning Time Series for Health Workshop

2020-2022 NeurIPS, Machine Learning for Health Workshop

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

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