

KYRA DELRAY

Oxford | Kyra.Delray@wolfson.ox.ac.uk

Summary

PhD Candidate in Statistics & Machine Learning at the University of Oxford, specializing in personalized causal inference for recommendation systems with large observational datasets. Part time Head of Data Science at Genletics, developed a patent-pending machine learning system for predicting personalized circadian rhythms using digital survey, genetic, sleep & physical activity data. Experience in medical imaging and wearable technology, improving diagnostic accuracy using sim-to-real methodology and human activity recognition through applying NLP algorithms with time-series data, respectively. Former Research Fellow at UCL, conducted statistical analysis on effect of the menstrual cycle on physical and mental health, using wearable data and clinically validated digital health survey data as well as being a lead statistician on two clinical trials. Strong teamwork, leadership & communication skills developed from being an international medalist, olympic level, rowing athlete.

Education

DPhil (PhD): Statistics University of Oxford Robin Evans' Causal Inference and Machine Learning Group (OX CS ML Group) Developing an algorithm for personalised recommendations for health management using a causal framework, policy optimisation, and work in heterogeneous effects for digital health apps EPSRC-funded Part of Health Data Science Cohort	2028 Oxford
MSc: Statistics University College London (UCL) Part of NIHR Pre-doctoral Fellowship. Research project on developing methods for analysing the effects of the menstrual cycle to enhance understanding of causal relationships in women Developed collaboration with digital health app, Flo Established framework for cyclical, continuous, and daily prediction of the effects of the menstrual cycle now used in the Flo app.	2024 London
BSc: Statistics University of California, Los Angeles (UCLA) 100% Athletic Scholarship Dean's Prize of Excellence for final research project on establishing the relationship between characteristics and mental health with metabolites found in brain fluid (CSF).	2019 Los Angeles

Experience

PhD Candidate - Statistics & Machine Learning University of Oxford	09/2024 to Current Oxford, UK
- Conducting research on personalized causal inference methods for recommendation systems. - Developing ML and statistical models for individual-level decision-making from large observational datasets. - Focus on policy optimization, heterogeneous effects, and counterfactual quality quantification. - Utilized real-time data from Juli, a digital health app for mental health management. - Established collaboration between Juli, University College London, and University of Oxford to advance research initiatives.	
Head of Data Science (Part Time) Genletics	09/2024 to Current Remote
- Developed patent-pending machine learning system integrating survey, molecular genetic data, sleep and forceplate jump data for personalized circadian rhythm prediction with >95% of ground truth. - Led team from trial design to genetic material, survey and physical activity collection, established a repeatable trial framework.	
Statistics Consultant Health Tech Build	09/2023 to Current Boston
Create scripts for animated videos to explain ML methods in start-ups AI in health tech to possible investors or consumers.	

**ML Researcher - Computer Vision, Noble Lab
University of Oxford**

**06/2025 to 09/2025
Oxford, UK**

- Collaborated with a sonographer expert to identify and implement effective ML algorithms for shadow detection, improving diagnostic accuracy.
- Enhanced algorithm prediction accuracy by developing and executing a sim-to-real pipeline, facilitating better real-world application.
- Vision Transformers and NN architecture.

**ML Researcher, OxWearables Group
University of Oxford**

**04/2025 to 06/2025
Oxford, UK**

- Developed tokenization algorithm for wearable sensor time-series using NLP techniques to enhance data analysis.
- Engineered prediction model for human activity recognition from tokenized time-series data, improving accuracy of activity classification.
- Created algorithms to infer activities from raw IMU data through effective tokenization, enabling real-time activity monitoring.

**Research Fellow - Statistics
UCL**

**09/2021 to 08/2024
London, UK**

- Led statistical analysis for two clinical trials comparing efficacy of Juli app against placebo for asthma and depression management.
- Conducted research during NIHR Fellowship on large-scale datasets to link mood with the menstrual cycle and heart rate variability signals, enhancing understanding of physiological and psychological interactions.
- Utilized real-world digital data and wearables to analyze menstrual cycle effects on heart rate variability.
- Analysed data from over 1,000 women to develop cyclical predictions of heart rate markers and mental health, contributing to improved insights into female health patterns.
- Collaborated with digital mental health app Juli to explore relationships among heart rate, menstrual cycle, and mental health.
- Established collaboration with digital health app Flo, accessing data from over 3 million users.
- Presented findings at Women's Health Innovation Summit, promoting personalized analysis of heart rate and menstrual cycles.

Sporting Accomplishments

- Great Britain Olympic Level Rower. International medallist from junior, under-23 and senior level
- Oxford University Boat Club, Vice President. Blue Boat 2025.
- Team leader and culture driver.

Skills

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| • Machine learning | • Algorithm Development |
| • Data analysis | • Data Visualization |
| • Project management | • Team Leadership |
| • Statistical modelling | • Collaboration and Communication |
| • Causal Inference | • Digital Health Applications |

Invited Talks

- **Bringing Team Culture Values to Life**, Oxford University Boat Club, Jan 2026
- **Guest Speaker**, St Paul's School (Black History Month), Oct 2025
- **Menstrual Cycle, Mood, and Heart Rate: Evidence from Digital Health Apps**, Contributed Talk, Podium Institute Annual Conference, Sep 2025
- **Life as Forever Athlete**, Gatorade, Aug 2025
- **Life-Inspired Research**, NIHR Pre-Doctoral Fellowship Conference, Nov 2024
- Making Life Work: **Greater Than the Sum of Our Parts**, Stanford Legal, Sep 2024
- **Me, Myself and the Menstrual Cycle**, Genletics, Cardiff University, May 2024
- **Reducing Bias in Healthcare AI**, MIT Workshop, Jul 2024
- **BBC Boat Race**, Documentary on my research in MC and HR, Presenter & Writer. (Audience: 6 Million) Apr 2024
- **BBC Boat Race**, pundit, Apr 2023 & 2024

Publications

- Delray K, Lewis G, Hayes JF. **Tracking mood symptoms across the menstrual cycle in women with**

depression using ecological momentary assessment and heart rate variability. *BMJ Mental Health*. 2025;28:e301674. <https://doi.org/10.1136/bmjment-2025-301674>

- **RANDOMIZED ATTENTION-PLACEBO CONTROLLED TRIAL OF A DIGITAL SELF-MANAGEMENT PLATFORM FOR ADULT ASTHMA**
Kandola, A. et al. *Annals of Allergy, Asthma & Immunology*, Volume 131, Issue 5, S58
- Kandola A, Edwards K, Muller MA, Dührkoop B, Hein B, Straatman J, Hayes JF. **Digitally managing depression: A fully remote randomised attention-placebo controlled trial**. *Digit Health*. 2024 Jun 7;10:20552076241260409. doi: 10.1177/20552076241260409. PMID: 38854919; PMCID: PMC11162123.
- Delray, K & Glyn Lewis, **Effect of the Menstrual Cycle on Heart Rate**. (Poster) *Women's Health Innovation Summit*, 2023.