Predicting Near-Future Student Mental Wellbeing from Wearable Sensor Data
EPSRC funded PhD studentship with full fee waiver and £21,805 pa stipend (2026/27 rate)

Project Code: DLA_DTP_2026_16

Main Supervisor: Dr Tianhua Chen

Co-Supervisor: Dr Matthew Mantle

Project Introduction

This PhD project explores whether physiological and behavioural data from wearable devices (e.g., Apple Watch, Android wearables via HealthKit) can predict near-future changes in student mental wellbeing. Using multimodal time-series data such as sleep, activity, heart rate and routine patterns, the project will develop machine learning models to link physiological signals with self-reported mood and wellbeing. The focus is on robust modelling of noisy, irregular wearable data, handling missingness and individual differences, and producing interpretable predictors. The aim is to identify reliable digital markers of mental wellbeing trajectories to support early-warning and prevention strategies, with primary contributions in data modelling and AI methodology.

Project Details

Student mental wellbeing is an increasing concern across higher education, with rising prevalence of stress, anxiety, low mood, and burnout. Current support systems are largely reactive, relying on self-report surveys or help-seeking behaviours that often occur after difficulties have escalated. This PhD project aims to explore whether routinely collected physiological and behavioural data from wearable devices (e.g., Apple Watch or Android-based wearables) can be used to predict short-term changes in student mental wellbeing, enabling earlier and more proactive support.

The project will focus on modelling and data analysis using multimodal time-series data derived from wearable sensors and mobile health platforms such as Apple HealthKit. Candidate data streams include activity and exercise patterns, sleep duration and regularity, heart rate and heart rate variability, and daily routines. These will be aligned with periodic self-reported measures of wellbeing, mood, stress, and mental health symptoms to provide ground truth labels. A key research question is whether specific physiological patterns, or subsets of these signals, can reliably predict near-future changes in mental state (e.g., deterioration or improvement over the following days or weeks).

Methodologically, the project will investigate a range of machine learning and statistical modelling approaches for irregular, noisy, and partially observed longitudinal data. This may include feature learning from wearable time series, temporal models (e.g., state-space models, hidden Markov models, recurrent or transformer-based models), and representation learning for multimodal fusion. Particular attention will be paid to handling missing data, inter-individual variability, confounding factors (e.g., exams, deadlines, illness), and model interpretability, so that the resulting models can support meaningful insights rather than black-box predictions.

Beyond predictive performance, the project will examine the robustness, generalisability, and fairness of models across different student subgroups and contexts. The ultimate aim is to identify reliable digital markers of mental wellbeing trajectories and to translate these into computational tools that could inform early-warning systems and personalised prevention strategies. While the broader application is in student mental health support, the core contribution of the PhD lies in advancing methods for modelling complex, real-world wearable data and linking physiological dynamics to changes in mental wellbeing in a rigorous, reproducible way.

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Project-specific entry requirements

An ideal candidate would have a good honours degree in computer science, mathematics or a related scientific discipline. The candidate will have demonstrable knowledge in machine learning and possibly experience working with health data. The candidate should also have the proficiency in the use of mainstream data analytics platforms such as Python (preferred). Good professional communication skills (written and verbal) are also expected.

Further Information

This call is open to **UK Applicants only**.

Applicants should be of outstanding quality and exceptionally motivated.

The studentships are funded for 3 years (subject to satisfactory annual performance and progression review) and will provide for tuition fees and a tax-free stipend paid monthly.

Please note that there are more projects than funded studentships available and therefore this is a competitive application process which will include an interview. Shortlisted candidates will be contacted for an interview in person or via Teams. After interview the most outstanding applicants will be offered a studentship.

Queries about the application process are welcome and should be emailed to pgrscholarships@hud.ac.uk.

Informal enquiries about this project should be directed to Dr Tianhua Chen.

Type of Award: Doctor of Philosophy (PhD).

Eligibility: UK applicants only. First Class or Upper Second-Class Honours degree or equivalent in a relevant subject area, please refer to the entry requirements on the specific projects being advertised.

Location: Huddersfield.

Funding: 3 years full time research covering tuition fees and a tax-free bursary (stipend) starting at £21,805 for 2026/27 and increasing in line with the EPSRC guidelines for the subsequent years. Funded via the Engineering and Physical Sciences Research Council Doctoral Training Programme.

Duration: 3 years full-time plus 12 months writing up (please note that no funding is available for the writing up period).

Closing date: 28th April 2026

Start date: 1st October 2026

Application details

- Go to the EPSRC webpage and download the Expression of Interest Form 2026.
- Provide copies of transcripts and certificates of all relevant academic and/or any professional qualifications.
- Provide references from two individuals – please contact your referees and ask them to send them directly to pgrscholarships@hud.ac.uk from their email address.
- Proof of eligibility – e.g. scan of passport photo page
- Completed forms, including all relevant documents should be submitted via-email to pgrscholarships@hud.ac.uk.

Please note: if you do not attach all the relevant documentation prior to the closing date your application will not be considered.

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