

JAKE STUCHBURY-WASS

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EDUCATION

10. 2022 – PRESENT UNIVERSITY OF CAMBRIDGE – PhD COMPUTER SCIENCE

- PhD – Mobile Systems Group supervised by Prof. Cecilia Mascolo: My work focuses on novel wearable sensing modalities for mobile health and fitness monitoring. Specifically, looking at a fusion of audio and inertial sensing from earables for detailed gait analysis and sports applications.

10. 2021– 09.2022 UNIVERSITY OF CAMBRIDGE – MRes (SENSOR TECHNOLOGIES)

- MRes Project –Project studying a novel sensing location on the abdomen for the extraction of vital signs from noisy audio data. This led to an ICASSP paper demonstrating results comparable to consumer PPG based devices. This work was in collaboration with Nokia Bell Labs Cambridge.

10. 2017 – 06.2021 UNIVERSITY OF CAMBRIDGE – MEng, BA ENGINEERING (INFOMRATION AND COMPUTER ENGINEERING)

- Merit grade overall, with a Distinction in the Master's research project.
- Relevant Courses: Deep Learning, Probabilistic Machine Learning, Computer Systems, Embedded Systems, Signals Processing, Sensor Devices, Analog Circuit Design, Communication Systems.

SKILLS

- **PYTHON, MATLAB, C++** - I have experience in data analysis and visualisation in general-purpose programming languages through research projects and university courses.
- **PYTORCH** – Implementing machine learning models and training loops for time series data.
- **KICAD** – Electronic circuit design and prototyping for sensing systems.
- **EXPERIMENTAL DESIGN** – Designing experiments to validate wearable sensing methods and algorithms involving human participants, I've tested in controlled lab environments and in-the-wild.
- **DIGITAL SIGNAL PROCESSING** – Implementing signal processing pipelines for processing wearable sensing data

PUBLICATIONS

(Accepted) WalkEar: Holistic gait monitoring from earable devices.

Jake Stuchbury-Wass, Yang Liu, Kayla-Jade Butkow, Josh Carter, Qiang Yang, Mathias Ciliberto, Ezio Preatoni, Dong Ma & Cecilia Mascolo. (2025) In *PerCom 2025 IEEE International Conference on Pervasive computing and communications*,

(Accepted) RespEar: Earable-Based Robust Respiratory Rate Monitoring.

Yang Liu, Kayla-Jade Butkow, Jake Stuchbury-Wass, Adam Pullin, Dong Ma, & Cecilia Mascolo. (2025). In *PerCom 2025 IEEE International Conference on Pervasive computing and communications*

(Accepted) Smarteeth: Augmenting Manual Toothbrushing with In-Ear Microphones.

Qiang Yang, Yang Liu, Jake Stuchbury-Wass, Kayla-Jade Butkow, Emeli Panariti, Dong Ma, & Cecilia Mascolo. (2025). In *proceedings of the 2025 on ACM CHI Conference on Human Factors in Computing Systems*.

Heart Rate Extraction from Abdominal Audio Signals.

Jake Stuchbury-Wass, Erika Bondareva, Kayla-Jade Butkow, Sanja Šćepanović, Zoran Radivojevic, & Cecilia Mascolo. (2023) In *ICASSP 2023 IEEE International Conference on Acoustics, Speech and Signal Processing*.

Multimodal attention networks for human activity recognition from earable devices.

Jake Stuchbury-Wass, Andrea Ferlini, & Cecilia Mascolo. (2022). In *Adjunct Proceedings of the 2022 ACM International Joint Conference on Pervasive and Ubiquitous Computing and the 2022 ACM International Symposium on Wearable Computers*.

OpenEarable 1.4: Dual Microphones Earpiece to Capture In-Ear and Outer-Ear Audio Signals.

Tobias Röddiger*, **Jake Stuchbury-Wass***, Mathias Ciliberto, Philipp Lepold, & Michael Beigl. (2024). In *Companion of the 2024 on ACM International Joint Conference on Pervasive and Ubiquitous Computing*. *Joint first authorship

Detecting Foot Strikes during Running with Earbuds. Changshou Hu, Thivya Kandappu, **Jake Stuchbury-Wass**, Yang Liu, Anthony Tang, Cecilia Mascolo, & Dong Ma. (2024). In *Proceedings of the Workshop on Body-Centric Computing Systems*.

BrushBuds: Toothbrushing Tracking Using Earphone IMUs.

Qiang Yang, Yang Liu, **Jake Stuchbury-Wass**, Kayla-Jade Butkow, Dong Ma, & Cecilia Mascolo. (2024). In *Companion of the 2024 on ACM International Joint Conference on Pervasive and Ubiquitous Computing*.

RELEVANT EXPERIENCE

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| 01/2024 | WINTER SCHOOL ON SIGNAL PROCESSING FOR HEARING AIDS <ul style="list-style-type: none">▪ Learning and writing code for state-of-the-art hearing aid algorithms▪ Jointly run by Oticon and the University of Aalborg |
| 07.2021 – 03.2022 | TECHNICAL CONSULTANT – BRITISH CYCLING <ul style="list-style-type: none">▪ Running in-the-wild and controlled lab experiments with developed distributed sensors and performing data analysis with a focus on uncertainty analysis. |
| 06/2019 – 09/2019 | UNDERGRADUATE RESEARCHER - UNIVERSITY OF CAMBRIDGE, TRANSPORT RESEARCH GROUP <ul style="list-style-type: none">▪ Developing embedded systems to work to display messages to HGV drivers with information from a server sent over 3G to improve driving behaviors. |

TALKS

- **Workshop presentation - MobiUK 2023 – Vital sign detection from abdominal audio**
- **Invited Talk - University of Bath, Department of Health - Using earables for kinetic gait parameter estimation while walking 2025**
- **Invited Talk - University of Cambridge, Department of Engineering – Inertial sensing for ground reaction force estimation from earables, 2025**

TEACHING EXPERIENCE

- **Student Dissertations:** I also supervise student projects on machine learning topics.
- **Teaching assistant:** Master's level course "Mobile Health", teaching students signal processing and machine learning methods for real wearable sensor data
Undergraduate level course – Machine Learning and real world data where students implement simple machine learning models from scratch
- **Small group teaching courses including:** Digital Signal Processing, Linear Systems, Control Theory and Digital Communications.
- **Cambridge Undergraduate Technical Interviewer for Magdalene and Emmanuel Colleges.**

ACADEMIC SERVICES

- **Earcomp'24 Workshop Website and Publication Chair.**
- **Reviewing papers for Transactions on Mobile Computing Journal and ICASSP Conference.**