

Simon Nunayon

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Education

Emmanuel College, University of Cambridge

October 2025 – Present

Candidate for PhD in Clinical Neurosciences

Awarded £55,000 by the Cambridge Hearing Trust and private benefactors

Emmanuel College, University of Cambridge

October 2024 – September 2025

MPhil Medical Sciences Department of Clinical Neuroscience

Harvard-UK Paul Williams Fellow at Emmanuel College

Harvard University, Cambridge MA, USA

September 2020 – May 2024

B.S. in Electrical Engineering

GPA: 3.64/4.0

Relevant Courses: Biological Signal Processing, Applied Electromagnetism, Neuroengineering, Analog Circuits and Op-Amps, Digital Circuits and FPGA Programming, Nanofabrication, Fourier and Complex Analysis

Research Projects

Cochlear Implant-based Cortical Activity Recordings

October 2024 – Present

Professor Manohar Bance, in collaboration with Advanced Bionics

University of Cambridge, UK

- Secured £10,000 in funding from the Royal National Institute for Deaf People to develop EEG phantoms
- Automated Electrical Impedance Spectroscopy on potential phantom materials to measure frequency-dependent impedance, phase and group delay to identify electrical equivalents for human tissue. Fit spectra to a resistor capacitor model and Cole-Cole model to determine material conductivity and capacitance
- Prototyped EEG phantoms with 6 different conductivities and cortical signal generator simulators optimised for noise floor, sensitivity, frequency response and sampling rate to reproduce EEG recordings. Constructed equivalent COMSOL models to verify phantom accuracy and minimise generator crosstalk
- Identified optimal configurations for ipsilateral stimulation and recording from a cochlear implant (CI). Developed noise removal algorithm to improve signal-to-noise ratios in simulated cortical recordings by up to 13dB. Identified settings to minimise device stimulation artefacts by 40dB
- Led a 16 patient study to assess the feasibility of ipsilateral stimulation and recording in CI recipients. Designed the experimental set-up, stimuli and selected the necessary conditions and configurations to test. Validated CI cortical recordings against concurrent scalp-EEG recordings to evaluate feasibility

Head-Related Transfer Function Estimation

September 2023 – May 2024

Professor Demba Ba

Harvard University, USA

- Designed an algorithm to provide accurate head-related transfer functions for users of in-the-canal hearing aids. Functions are used to simulate auditory environments for rehabilitation and diagnoses, allowing patients to correctly perceive the location of a sound. Provided functions present horizontal localisation error (1.86°) comparable to biological standard (0 - 1°) and significantly better than chance (4.53°)
- Simulated 8649 perceptual experiments in MATLAB, applied Recursive Feature Elimination to Support Vector Machines to identify anthropometric factors associated with high-performing functions
- Trained a convolutional neural network to directly estimate the spherical harmonic coefficients of head-related transfer functions measured from the entrance to the ear canal based on a reduced set of anthropometric features
- Applied Principal Component Analysis and scaled Euclidean distance to identify most suitable transfer functions for virtual-reality hearing rehabilitation

Decoding Single Channel Forearm EMG Data

November 2022 – December 2022

Professor Demba Ba

Harvard University, USA

- Performed Principal Component Analysis, Linear Discriminant Analysis, and K-means clustering while exploring computationally simple procedures for real-time processing to decode guitar playing style from surface EMG data
- Use of a plectrum instead of fingers could be identified with an 83% true positive rate, individual finger use could not be accurately identified

Skills

Applications: LT Spice, COMSOL, Ansys, Autodesk Fusion, nTop, Gorilla, LabView, Logic Pro, Audacity

Programming: Python, C, C++, MATLAB, SystemVerilog, SQL, Scikit-Learn, Mongo DB, Pandas, JavaScript

Technical: Rapid Prototyping, Benchtop Testing (Electrical/Mechanical), Reactive-Ion Etching, Photolithography

Professional Experience

COSA

R&D Experimental Engineer

Cambridge, UK

August 2025 – Present

- Prototyped an ear mount to deliver and measure near-infrared radiation for cochlea gene therapy. Developed a Python computer vision algorithm to measure and control radiation delivered
- Developed key components for simulating needle and catheter insertion on an automated benchtop testing rig to measure penetration forces on round window membrane models. Components ensured mechanical reliability and accuracy of the delivery system for over 100 insertions, maximising ecological validity

UCL Ear Institute | Lesica Lab

Research Assistant

London, UK

May 2022 – August 2023

- Designed a medium-scale remote study with Gorilla to assess the malleability of frequency compensation in humans with attention checks and randomisation to maximise response quality. Presented participants with stimuli modified by 8dB in frequencies and collected preference when compared to a neutral sample
- Minimised variability of testing conditions by screening participant environments using deconstructive wave interference. Further standardised study by modifying stimuli according to the frequency response of participants' headphones

xMentium | Legal Engineering Start-up

Machine Learning Intern

Remote, USA

June 2021 – August 2021

- Single-handedly developed backend analytical microservices with Python, Pandas, and MongoDB for legal engineers to understand client behaviour. Robust codebase was deployed and surpassed employer expectations

Engineering Projects

Bass Guitar Signal-to-Noise Optimisation Plugin

May 2022 – September 2022

- Created a system for low-cost recording equipment to improve sound fidelity before digital processing
- Optimised signal frequency identifier, computes digital filters to attenuate noise and boost note harmonics
- Achieved 30% noise attenuation by manipulating Short-Time-Fourier-Transform

Gyroscopic Kalimba

May 2021

- Augmented a Kalimba by adding an Inertial Measurement Unit and piezoelectric pickups. IMU controlled effects with a Teensy microcontroller programmed in the Arduino IDE. A video is available [here](#)
- Implemented active filtering circuit for pickups into the microcontroller. Designed cascaded filters to remove DC offset and noise. Integrated opamp circuits for surge protection and amplifying output to line level

Let's Practise!

December 2020

Constructed a [web application](#) for musicians and actors using Python, SQL, Flask, HTML, and JavaScript

Additional Experience

Harvard School of Engineering and Applied Sciences

Electrical Engineering Teaching Fellow

Cambridge MA, USA

January 2022 – May 2023

- Taught a weekly tutorial to 10-15 students on analog and digital circuitry. Direct communication with the head professor to optimise student outcomes. Provided individualised support to struggling students
- Mentored 4 student groups for final projects, my previous work was used as an exemplary reference

Harvard Songwriters' Collective

President

Cambridge MA, USA

January 2022 – January 2023

- Led a group of 12 songwriters to release an album. Facilitated recording and live performance opportunities
- Produced and released my debut [album](#) (2021). Recorded 44 parts, used self-taught audio engineering skills

Great Britain Rowing Team

Athlete

Reading, UK

July 2018 – July 2021

- Under 23 World Champion and Under 19 World Bronze Medallist in the men's coxed eight