

Pierre Hieu Guillemineot

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EDUCATION

10.2019 - 04.2023 (expected)	PhD in Neurotechnology Department of Bioengineering & Centre for Neurotechnology, Imperial College London, UK <u>Thesis</u> : <i>Neural Mechanisms of Audio Tactile Speech Integration</i> , supervised by Prof. Tobias Reichenbach, Prof. Etienne Burdet
10.2018 - 09.2019	MRes in Neurotechnology (Distinction) Department of Bioengineering & Centre for Neurotechnology, Imperial College London, UK <u>Main Courses</u> : <i>Statistics and Data Analysis, Neuroscience, Mathematical methods for bioengineering, Hearing and Speech Processing</i> <u>Thesis</u> : <i>Engineering Tactile Signals for Hearing Aids</i> , supervised by Prof. To- bias Reichenbach, Prof. Etienne Burdet
10.2015 - 09.2018	Engineering Diploma (Distinction) Department of Bioengineering - Medical Imaging Grenoble INP - Phelma, France <u>Thesis</u> : <i>A Robotic Supernumerary Thumb for Complex Musical Tasks</i> , super- vised by Prof. Aldo Faisal
10.2015 - 02.2016	BEng in Engineering Department of Engineering Grenoble INP - Phelma, France <u>Main Courses</u> : <i>Physics, Electronics and Signal Processing</i>
10.2012 - 02.2015	Preparatory Classes for Engineering Schools MPSI - MP Lycee Condorcet Paris, France <u>Main Courses</u> : <i>Maths, Physics, Computer Science</i>

RESEARCH EXPERIENCE

10.2017 - 08.2018	Research intern Brain And Behaviour Lab, UK <u>Duties</u> : Design of a Robotic Supernumerary Controlled using Limb Substitu- tion (C#, Arduino). Experimental Setup Design and Data Analysis Pipeline of the use of the finger for Complex Musical Tasks (Matlab, Optitracks). Super- vised by Prof. Aldo Faisal.
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05.2016 - 08.2016

Undergraduate Research assistant

Satoh Lab, Okayama University,

Duties: Animal Surgery, DNA sequencing and in situ Hybridization to study the Axolotl regeneration mechanisms. Supervised by Prof. Akira Satoh

SKILLS & AREAS OF EXPERTISE

Quantitative background: Broad training in engineering, applied mathematics and statistics with focus on biosignal processing, computation modelling and data analysis. Demonstrable experience in developing and applying custom machine learning frameworks (scikit-learn).

Programming and computational background: Demonstrable strong programming skills in Python and MATLAB, including many specialized packages/toolboxes/APIs. Basic programming skills in C/C# and Labview. Basic modelling skills in Comsol. Demonstrable experience in processing large volumes of data and high-performance computing.

Speech signal processing: Demonstrable experience in speech signal processing with particular focus on extracting speech features at an acoustic and phonetic level.

Neuroscience tools: Electroencephalography (EEG) Analysis and Modelling, Auditory Brainstem Responses (ABR), Multisensory Stimulation for Cognitive Experiments, Inertial Measurement Unit (IMU) for Human Machine Interface.

PUBLICATIONS

A Shafti, S Haar, R Mio, **P Guillemot**, AA Faisal (2021). Playing the piano with a robotic third thumb: Assessing constraints of human augmentation. *bioRxiv*.

DOI: <https://doi.org/10.1101/2020.05.21.108407>

J Cunningham, A Hapsari, **P Guillemot**, A Shafti, AA Faisal (2018) The Supernumerary Robotic 3rdThumb for Skilled Music Tasks. *Biorob 2020*, 665-670, DOI: [10.1109/BIOROB.2018.8487609](https://doi.org/10.1109/BIOROB.2018.8487609)

CURRENT WORK I am currently studying the neural mechanisms of the audio-tactile integration of speech. This project aims at combining tactile signals with natural speech in order to improve comprehension in challenging conditions and further understand this potential mechanisms by analyzing EEG data (Forward and Backward model, Spectral Power, Cross-Frequency Coupling..)

COMMUNITY SERVICE, TEACHING & PUBLIC ENGAGEMENT (selected)

Research (co)supervision

Emilia Butters (MSc thesis, Imperial College London, 2019-2020)

Arianne Robert de Saint Victor (Mres thesis, Imperial College London, 2020-present)

Graduate teaching assistant

Department of Bioengineering

Imperial College London, UK

Courses:

- Statistics and Data Analysis (2018 - present)
- Brain-Machine Interfaces (2018 - present) - BMI GTA Award 2021
- Hearing and Speech Processing (2018 - present)
- Modelling in Biology (2019 - 2020)
- Maths II (2019 - 2020)

Co-organizer of the CDT Neurotechnology stand

Imperial Science Festival 2019

Description: Creating and Animating a stand using a music creation game based on EMG and EEG signals, as well as a rigged Speech Recognition based Rock Paper Scissors game.

Science Communication Workshop

Imperial College London, 2019 - present

Description: Learning and Preparing Oral Skills with the goal of making a public speech about science communication.

PROFESSIONAL AFFILIATIONS

2018 - present Association for Research in Otolaryngology (ARO), student member

LANGUAGES

English: Professional proficiency (IELTS C2 Level)

German: Elementary knowledge (A2)

Japanese: Elementary knowledge (A2)

French: Native speaker

REFERENCES

MRes & PhD supervisor: Prof. Tobias Reichenbach, Head of Sensory Neuroengineering group, Department for Artificial Intelligence in Biomedical Engineering (AIBE), Friedrich-Alexander-University (FAU) Erlangen-Nuremberg, Germany. Email: tobias.j.reichenbach@fau.de

PhD co-supervisor: Prof. Etienne Burdet, Professor of Human Robotics, Department of Bioengineering, Centre for Neurotechnology, Imperial College London, UK. Email: e.burdet@imperial.ac.uk

Research supervisor: Prof. Aldo Faisal, Professor of AI & Neuroscience, Department of Bioengineering, CDT AI of Healthcare, Imperial College London, UK. Email: a.faisal@imperial.ac.uk

Undergraduate Research supervisor: Dr Akira Satoh, Associate Professor of Regenerative Medicine, Okayama, Japan. Email: satoha@cc.okayama-u.ac.jp