

Pierre Hieu Guillemint

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EDUCATION

10.2019 - 06.2023 (expected)	PhD in Neurotechnology - Computational Neuroscience Imperial College London, UK - Centre for Neurotechnology, <u>Thesis</u> : <i>Neural Mechanisms of Audio Tactile Speech Integration</i> <u>Skills</u> : <i>EEG Signal Processing, Spiking Neural Network, Statistics, Computational Modelling</i>
10.2018 - 09.2019	MRes in Neurotechnology (Distinction) Imperial College London, UK - Centre for Neurotechnology, <u>Thesis</u> : <i>Engineering Tactile Signals for Hearing Aids</i> <u>Skills</u> : <i>Speech Processing, Speech recognition, Biostatistics, Deep Learning, Cognitive Neuroscience</i>
10.2015 - 09.2018	Msc in Bioengineering (Distinction) Grenoble INP - Phelma, France - Department of Bioengineering <u>Thesis</u> : <i>A Robotic Supernumerary Thumb for Complex Musical Tasks</i> <u>Skills</u> : <i>Signal Processing, Robotics, Software Engineering</i>
10.2015 - 02.2016	BEng in Engineering (Distinction) Grenoble INP - Phelma, France - Department of Physics and Signal Processing <u>Main Courses</u> : <i>Maths, Signal Processing, Physics</i>
10.2012 - 02.2015	Preparatory Classes for Grande Ecoles Lycee Condorcet Paris, France <u>Major</u> : <i>Maths, Physics</i> <u>Minor</u> : <i>Computer Science</i>

RESEARCH EXPERIENCE

09.2022 - 04.2023	Data Scientist(part-time) - Neural Data Processing INBRAIN Neuroelectronics - INNERVIA Bioelectronics - Data Intelligence <u>Duties</u> : <i>Neural Interface Characterization. Neural Data Analysis. Computational Modelling. Machine Learning.</i>
03.2022 - 09.2022	Research Scientist Intern - Neural Interface INBRAIN Neuroelectronics - INNERVIA Bioelectronics - Data Intelligence <u>Duties</u> : <i>Neural Interface Characterization. Software Engineering on a Neural Interfacing System. Neural Data Analysis. Computational Modelling.</i>
10.2017 - 08.2018	Research Intern Imperial College London - Brain And Behaviour Lab <u>Duties</u> : <i>Design and Control of a Robotic Supernumerary Finger. Experimental Setup and Analysis of finger usage for Complex Musical Tasks.</i>

SKILLS & AREAS OF EXPERTISE

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

Programming and computational background: Strong programming skills in Python. Demonstrable experience in high-performance computing, deep learning and general software engineering.

Speech signal processing: Speech processing with particular focus on offline/online feature extraction using signal processing and deep learning.

Neuroscience tools: Electroencephalography (EEG) analysis and modelling. Nerve recording analysis and modelling. machine learning, deep learning and spiking neural networks for biologically-constrained models (brian2). Multisensory Stimulation and Inertial Measurement Unit (IMU) for BCIs.

PUBLICATIONS and PREPRINT

P Guilleminot, C Graef, E Butters, T Reichenbach (under review). Audiotactile stimulation can improve syllable discrimination through multisensory integration in the theta frequency band. *JOCN*

E Varano, **P Guilleminot**, T Reichenbach (2022). AVbook, a high-frame-rate corpus of narrative audio-visual speech for investigating multimodal speech perception. *JASA*

P Guilleminot*, M Kegler*, E Varano* (2021). sPyEEG: Package for modelling EEG responses to speech. (Zenodo)

P Guilleminot, T Reichenbach (2021). Enhancement of speech-in-noise comprehension through vibrotactile stimulation at the syllabic rate. *PNAS*

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

J Cunningham, A Hapsari, **P Guilleminot**, A Shafti, AA Faisal (2018) The Supernumerary Robotic 3rdThumb for Skilled Music Tasks. *Biorob 2020*

MENTORING AND RESEARCH SUPERVISION

Emilia Butters

Msc Student - Translational Neuroscience (2019-2020)

Project: *Exploring the roles of neural oscillations in syllables parsing.*

Stochastic modelling of behavioural responses to speech.

Arianne de St-Victor

Msc Student - Bioengineering (2020-2021)

Project: *Sensory substitution of hearing by touch using data from a robotic hand.*

Model of rigid contact body sounds.

Cosima Graef

Msc Student - Bioengineering (2021-2022)

Project: *Characterizing the brain responses to multisensory stimuli by relating EEG and behavioural data.*

TEACHING

Brain-Machine Interfaces

Imperial College London, UK - Department of Bioengineering (2018-now)

Teaching Award 2021

Description: *Supervise students during a machine learning competition. Teach neural data analysis and visualisation methods.*

Reinforcement Learning

Imperial College London, UK - Department of Computing (2021-2022)

Description: *Supervise students during practicals covering basic reinforcement learning (Bellman Equation, Markov Modelling) and deep reinforcement learning*

Probability and Statistics

Imperial College London, UK - Department of Bioengineering (2018-2022)

Description: *Teach the bases of probability and statistics*

Modelling in Biology

Imperial College London, UK - Department of Bioengineering (2019-2020)

Description: *Stochastic processes, differential equations and their applications to biology.*

Maths II

Imperial College London, UK - Department of Bioengineering (2019-2020)

Description: *Linear algebra and differential equations*

VOLUNTEERING & PUBLIC ENGAGEMENT

Co-organizer of the CDT Neurotechnology stand

Imperial Science Festival 2019

Description: Creating a real-time musical game based on EMG and EEG signals.
Creating rock-paper-scissors game based on speech recognition. The goal of the event was to present neuroscience research to a general public.

Bioeng Summer School Imperial College London

Imperial College London, 2021

Description: Promote neuroscience to highschool students.

Girls who ML - Lecture Series Winter 2021

Description: Volunteered to demonstrate workshops on machine learning and its application to different fields.

LANGUAGES

English: Professional proficiency (IELTS C2 Level)

German: Elementary knowledge (A2)

French: Native speaker

Spanish: Elementary knowledge (A2)

HOBBIES

Art: Drawing

Musical Training: Violin, Bass guitar

Game Theory: Automating solutions to various games