Charalambos Hadjipanayi

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Education Background

09/2020 – Present **Imperial College London – Department of Electrical and Electronic Engineering**

Major: Ultra-Wideband (UWB) radars for human motion analysis
Qualification: Doctor of Philosophy (Ph.D.)

10/2016 - 06/2020 **Imperial College London – Department of Bioengineering**

Major: Biomedical Engineering
Qualification: Master of Engineering (MEng)
Award: First Class Honours
Average Grade: 80.91%

09/2007 – 06/2014 **The Grammar School Nicosia**

School Leaving Certificate: (98+6/7) %
GCE A-Level Modules: Biology, Physics, Mathematics, Further Mathematics, Modern Greek
GCE A-Level grades: A*, A*, A*, A*, A

Past Academic Research Projects

10/2019 – 06/2020 **MEng Thesis: Improving the control performance of a powered lower limb exoskeleton for Cybathlon 2020.**

Hardware upgrades designed and implemented:

- Foot pressure sensing (FPS) system based on the center of pressure (CoP) shift of the body, using an array of pressure-sensitive elements embedded in silicone in-sole.
- Haptic feedback (HF) system providing intuitive haptic feedback to the user, based on foot plantar pressure measurements, using vibrotactile sensors attached to user's fingers.

See Project here.

02/2020 –03/2020 **Neural Decoder**

Aim: Design a causal neural decoder algorithm in MATLAB, with the ability to estimate, from spike trains recorded from a monkey's brain during an arm movement task, the precise trajectory (X & Y position) of the monkey's hand at each moment in time as it reaches for the target.

- Three classifiers, with Majority voting, were used for identifying reaching angle: k-Nearest Neighbors (k-NN), Support Vector Machine (SVM) and Bayesian.
- Principal Component Regression (PCR) was used to estimate the monkey's hand trajectory.

See Project here.

10/2018 - 06/2019 **Third Year Group Project: Perfusion Bioreactor for 3D cell culture**

Aim: Design a perfusion bioreaction that can replicate in vitro, with precise control, the mechanical strains encountered by cells in abdominal cavity.

Personal Objectives:

- Use a programmable hybrid linear actuator to mechanically stimulate cultured cells in the bioreactor using cyclic strains.
- Implement a perfusion device, involving a dual syringe pump and solenoid pinch valves, that supplies the cells with essential nutrients for survival.

See Project here.

02/2019 – 03/2019 **Realization of an Impedometric Respiration System**

Aim: Design and implement a prototype of an impedometric pneumometer on a stripboard, while quantifying the block-level deviations from ideality.

See Project here.

10/2017 – 06/2018 **Second Year Engineering Design Project: Assistive Technology Board Game - Design and Development**

Aim: Design of an assistive technology board game, for children with high level motor control disabilities, using different control technologies such as Voice Control, a Pushbutton, and an Eyebrow control unit (Mechanomyogram (MMG) sensor and Inertial Measurement Unit (IMU)), while providing audio and visual feedback.

The team implemented a four-player pinball-type game (called FlipAble). Personal objectives:

- Development of Voice Control (Word Detection) method.
- Implementation of the flipper mechanism.
- Mechanical assembly of the metal chassis and attachment the external walls.
- Design and implementation of a Ball counting mechanism (using IR-sensors and LCD screens).

See Project here.

02/2017 – 03/2017 **Heart Sound Amplifier**

Aim: Design a heart rate amplifier to create an electronic stethoscope.

- Heart sound amplifier was designed and modelled using PSpice (OrCAD Capture 16.6).
- The stethoscope was implemented in the lab using an electret microphone, the designed amplifier, and headphones.

See Project here.

Work and Research Experience

02/2021 – Present **Imperial College London – Department of Bioengineering**

Role: Graduate Teaching Assistant – Part-time.

07/2019 - 09/2019 **University of Cyprus – Department of Electrical and Computer Engineering**

Role: Summer Intern
Description: Expanding on the project of measurement of vital signs using Microwave Radar, under supervision of Prof. Constantinos Pitris. The objective was to develop a digital signal processing algorithm, in MATLAB, which would be able to extract patient's heart rate and breathing rate given Doppler Radar Signals. Reference heart and breathing rate samples were extracted from Electrocardiogram (ECG) recordings. Designed algorithm involved various signal processing techniques, such as digital filtering, Fast Fourier Transform, Welch, Burg, Yule-Walker, and Lomb-Scargle PSD estimation methods. See Project results here.

07/2018 – 08/2018 **Scientronics Ltd. Cyprus**

Role: Assistant Technician (8-week internship)
Description: Involved in maintenance of a range of medical equipment and instruments like ADVIA Centaur XP Immunoassay System (by Siemens), AutoVue Innova Immunohematology (by Ortho clinical diagnostics) and Stirrer bascule blood mixer and Scale (by Relmedic). Also involved in visiting customer premises, such as Hospitals, Research Institutions, Diagnostic Centers and Universities, delivering, installing, and repairing new equipment under supervision of experienced technicians and giving training to operators.

06/2015 – 07/2016 **National Guard of Cyprus**

Role: Electronic Telecommunication Operator
Description: During the second year of the compulsory two-year service in Cyprus National Guard, I was responsible for the operation of electronic communications and manager of the social media webpage of National Guard General Staff.

07/2013 – 08/2013 **University of Cyprus – Molecular Medicine Research Center**

Role: Summer Intern
Description: Involved in observing and performing molecular experimental procedures under the supervision of Prof. Constantinos Deltas.

Honours and Awards

08/2019 **Dean's list during 3rd year at Imperial College London**
Grade: 80.11%

08/2018 **Dean's list during 2nd year at Imperial College London**
Grade: 86.2%

08/2017 **Dean's list during 1st year at Imperial College London**
Grade: 84.3%

06/2014 **Academic excellence award for years 2007-2014 at Grammar School Nicosia**

07/2012 **Highest International mark (joint) in Edexcel GCSE Mathematics**

Software and Programming skills

- MATLAB
- Python
- C
- C++
- Arduino
- OrCAD PSpice
- Autodesk Fusion 360
- SOLIDWORKS
- Altera Quartus
- Microsoft Office
- LaTex