

# Raymond Cadoc Miles

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## Education

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### 2017-2021 MEng Biomedical Engineering

- Degree class: Upper Second Honours (66.83%)
- **Courses:** Modelling in Biology, Advanced Synthetic Biology (Department of Life sciences), Digital Bio-signal processing, Advanced Signal Processing (Department of Electrical and Electronic Engineering), Reinforcement Learning (Department of Computing).

### Degree Projects:

- 2020-2021 MEng Project: "Selectivity properties of central auditory neurons"  
The project investigated the relation between the auditory stimuli and the neural response through the extraction of Spectrotemporal receptive fields (STRFs) from neurons in the mouse auditory cortex. This was done by comparing maximal entropy models (MNE) obtained from either the resized spectrogram, sparse filtered features or reduced dimension features obtained through Uniform Manifold Approximation and Projection (UMAP). The MNE model was also used to produce spiking rates compared to the real spike data from the neurons.
- 2018-2019 Imperial College Group Project.  
A project in Biofluidics and "organ on a chip" technologies. Designed a microfluidic device to entrap a biopsy sample and developed protocols for the analysis of the angiogenic potential of a biopsy.
- 2017-2018 Imperial College Group Project.  
Part of an engineering and design project for the design of a stair climbing wheelchair that would meet the specifications of Cybathlon

### 2012-2017 Galileo Scientific Institute, Italy

- Diploma di liceo scientifico with maximum mark 100/100

## Relevant Experience

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**2019-2020** Undergraduate iGEM (international engineered machine competition) team member for Imperial College. The team obtained a Gold medal for the creation of a website that allows to produce python scripts for DNA assembly.

- Developed skills in
  - Frontend web development in React JS
  - Production and handling of python scripts for the Opentrons OT-2 Liquid handler robot
  - DNA Assembly
  - Github, project organisation and good coding practices

**2018-2019** Undergraduate research opportunity placement at Dr. Green's lab at Imperial College on the characterisation in explanted rat sciatic nerves of the electrodes produced in the lab, as well as the comparison with some widely used industry electrodes. During this placement I learnt:

- How to define a research proposal

- The principles of safe nerve electrical stimulation
- How to carry out synthesis reactions and following protocols (specifically to produce conductive hydrogels)
- Electrical characterization of electrodes (Cyclic Voltammetry, Electrochemical Impedance Spectroscopy and Charge injection limits)
- Python programming, and during this placement I produced a Python program to read the data from the electrical characterization and display it
- About the design process in research, as well as troubleshooting and electronic data acquisition

**2018-2019** Imperial College wet labs:

- Experimentally determine the affinity of the enzyme-ligand interaction and use of spectrophotometers
- Restriction digests and electrophoresis
- Taking measurements of enzyme activity using initial rates and the determination of the kinetic parameters of an enzyme

**2017-2021** Societies and other engagements:

- Officiated at SynbiTECH 2019 as a volunteer
- Attended the ageing and the extension of life conference 2019 organized by the University College London Biopharma society)
- Attended conferences on Neuroscience (amongst which the annual research symposium of the Imperial Centre for Neurotechnology, and the Imperial College Meeting of the minds)
- Attended the totality of the SynBIC seminars on synthetic biology
- Attended the week long 13th IWBD 13th International Workshop on Bio-Design Automation where some incredible work was presented in areas of synthetic biology and bio-automation, as well as fantastic practical workshops that went from topics such as “chemical reaction network compilation to bayesian inference” and biomodel selection systems for gene circuit designs amongst others.
- Currently engaged in a molecular biology course offered by the “Università di Palermo”

## Positions of responsibility

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**2020-2021** Events Officer, Imperial College Synthetic Biology Society (SynBIC)

- Curated the SynBIC seminar series
- Part of the Launchpad supervision team

**2018-2019**, Promotions Officer, Imperial College Synthetic Biology Society(SynBIC)

- Handled promotion of events at SynBIC

## Skills

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IT skills:

- Proficient in C++, developed a protein database manager for a protein database in FASTA format .fa for my programming module and a reversi game
- Experience in C, Matlab and Arduino

- Proficient in Python, produced a Python program to read the data from the electrical characterization of an electrode and display it. Use of Python to produce protocols for Liquid handling robots
- Frontend Web Design in React JS and proficiency in Javascript
- Signal processing in Matlab and Python
- Completed the "Machine Learning" course offered by Harvard University on coursera and obtained a certificate.

Languages:

- Native speaker of Italian and English, holder of a A2 Delf certification in French as well as a B1 course certificate from the Centre d'Echanges Internationaux at the Eugène Napoléon in Paris.

**References available on request**

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