GEORGES NOMICOS

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EDUCATION

Imperial College London   **Oct. 2018 - Sept. 2019**
MSc Human and Biological Robotics with Merit

- Overall grade: 67%

Relevant modules: Machine Learning, Neuroscience, Machine Learning for Computer Vision, Medical Device Entrepreneurship, Statistics and Data Analysis, Robotics, Reinforcement Learning, Brain-Machine Interface, Computational Neuroscience, Human-Neuromechanical Control.

University of Birmingham   **Oct. 2015 - Jul. 2018**
BEng Mechanical Engineering, First class honour

- Overall grade: 77% (Top 5% of the cohort)

Relevant modules: Computing for engineering, Mathematics, Mechanics, Mechanical Design, Fluid Dynamics, Thermodynamics and Heat Transfer, Mechatronics, Sustainable energy, Statistics, Control Engineering.

AWARDS AND PUBLICATIONS

Department of Bioengineering **Bagrit scholarship** for the MSc in Human and Biological Robotics

Vibrational Analysis During Cell Injection in ICSI Operation, **MARSS Conference 2018**

TECHNICAL SKILLS

Computer Languages	Python, C++, Matlab
Machine Learning	Random Forest, SVM, Naive Bayes, XGBoost
Deep learning	Pytorch, Computer Vision (torchvision), NLP (torchtext)
Data mining	Python - numpy, pandas, sklearn, OpenCv, BeautifulSoup
Other Tools	LaTeX, Linux, CAD (Fusion and SolidWorks), ROS, Git, SQL

RESEARCH EXPERIENCE

**Sim2Real for simultaneous robotic manipulation and locomotion
with Deep Reinforcement Learning (DRL) for my MSc thesis**   **Jan. 2019 - Sept. 2019**

- Completed a literature review on robotics learning involving reviewing research papers and theory behind them.
- Trained and tested a robotic agent in a simulation engine using reinforcement learning as the optimizer and deep learning as a function approximator.
- Implemented training algorithms with Python and Pytorch, logging methods, dataset creation and contributed to the development of a robotic simulation tool (PyRep) for locomotion.
- Developed and tested two neural network architectures to solve the manipulation/locomotion coordination problem.
- Created a supervised learning image dataset of >250k entities with automatic generation and labelling. Trained a U-Net deep learning model with it on four GPUs.

**Robot capable of biological cell manipulation and injection
for my BEng thesis**   **Oct. 2017 - Jul. 2018**

· Derived an analytical model and created a simulation model in Matlab, of the vibration at the tip of an injection pipette.
· Implemented an algorithm based on Hough Transform to obtain a segmentation of the cell membrane.
· Programmed a controller for the robot - with the arduino library and the hardware API in Matlab - consisting of 5 motors board and a fine 3-axis linear stage.

PROJECT EXPERIENCE

Predicting monkey movements with Machine Learning   **Jan. 2019 - Apr. 2019**
MSc course project part of the Brain-Machine Interface module

· Applied my own neural network code in Matlab to predict the monkey's hand movements from sequence of neuron activations.
· Achieved the second-best accuracy on test data with a deep learning model consisting of a continuous output with an auxiliary classification task at training.
· Performed pre-processing of neural data by looking at raster plot, peri-stimulus time histograms and tuning curves.

**Generative Adversarial Network (GAN) for dataset
augmentation (MNIST digit dataset)**   **Jan. 2019 - Feb. 2019**
MSc course project part of the Machine Learning for Computer Vision module

· Implemented in Python with Pytorch conditional GAN and deep convolutional GAN (DCGAN) to generate fake digit images.
· Evaluated the effect of adding generated digit images in the real dataset to train a classifier to predict digits.
· Improved the DCGAN model to generate fake digit images by adding an auxiliary loss, originating from a trained digit classifier network.

Programming a neural network for classifying human activity   **Oct. 2018 - Dec. 2018**
MSc course project for the Machine Learning module

· Evaluated different machine learning algorithms (Naive Bayes, SVM, perceptron) for predicting human activity from 50 continuous features.
· Coded a neural network from scratch in Python and performed hyperparameter sweeps (random grid search).
· Investigated state-of-the-art training procedures for deep learning and implemented them: decaying learning rate, dropout, Adam optimizer, early stopping.

Design and build of a mobile manipulator robot   **Jun. 2019 - Sept. 2019**
Personal Project

· 3D printed and built a mobile robot with mecanum wheels and, designed and built a 5 joints robot arm to go on top.
· Set-up all the electronics with an Arduino for power control and Raspberry PI for wireless control.

INTERESTS

Outside work and studies, I am interested in keeping up with robot learning research and especially leveraging reinforcement learning and deep learning to solve complex task from vision only. My aim is to contribute the development of intelligent robotics system, capable of human-like behaviour. In my spare time I play tennis regularly and enjoy building personal projects from open-sourced software/hardware. I speak French natively, English and Italian proficiently, and can communicate in Spanish.