Quentin Ferry (Ph.D.)

Prospective ML Researcher/ Engineer

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Originally trained as an engineer, I have sinced worked in the fields of machine learning (MSc), synthetic biology/genome engineering (Ph.D.), and cognitive neuroscience (postdoc). Motivated by the desire to understand *intelligence,* my current research combines analysis of animal models and Deep Learning agents to characterize the formation, storage, and generalization of knowledge in biological and artificial brains.

Moving forward, I wish to use insights gathered from the brain to improve current artificial intelligence systems.

Education

PhD in Genomic Medicine and Statistics, awarded 01/2018
University of Oxford, Oxford, UK – 2013-2017

Master of Science in Biomedical Engineering,
Distinctions & best overall research project.
University of Oxford, Oxford, UK – 2011-2012

Undergradutate Studies reading Engineering
Ecole Centrale de Nantes, Nantes, France – 2009-2012

Research Experience

Picower Institute for Learning and Memory, BCS
Massachusetts Institute of Technology, US – 2018/present

(1) Combined animal behavior, biological techniques, and machine learning to characterize the formation, storage, and generalization of knowledge in the brain. (2) Performed similar analyses on trained deep neural networks to understand abstraction in artificial "brains".

- **Adviser:** Prof. Susumu Tonegawa
- **Fields:** Cognitive neuroscience & deep-learning

The MRC Weatherall Institute of Molecular Medicine (WIMM)
University of Oxford, UK – 2014/2018

(1) Development of inducible CRISPR-based transcription factors to reprogram cellular behaviour; (2) DNA and RNA editing using CRISPR-based strategies; (3) Development of a computational pipeline for the phenotypic analysis of genome editing events.

- **Adviser:** Prof. Tudor A. Fulga
- **Fields:** Genome engineering, Synthetic biology, Bioinformatics

Visual Geometry Group & MRC Functional Genomics Unit
University of Oxford, UK – 2012/2014

Application of machine learning and computer vision techniques for (1) the diagnosis of dysmorphic syndromes from ordinary patient photographs, (2) phenotype-based patient clustering to aid de novo disease identification.

- **Advisers:** Prof. Andrew Zisserman, Dr. Christoffer Nellaker
- **Fields:** Genetics, Computer Vision, Machine learning

INSERM U825 (Cerebral imagery and neurologic handicap laboratory)
Toulouse, France – May/September 2011

Cerebral connectivity and cortical atrophy in neurodegenerative diseases: Investigation of DTI-MRI based biomarkers for the early diagnosis of Alzheimer's disease.

- **Advisers:** Dr. Pierre Celsis, Dr. Florent Aubry
- **Fields:** Diffusion tensor imaging, Image analysis, Signal processing

Selected Publications/ Patents

Ferry, Q. R. V. & Fulga, T. A. (2020).**CRISPR Guide RNA Design, Methods and Protocols.** Methods Mol Biology 2162, 153–184**.**

Wu, Q.*, **Ferry, Q. R. V.*** et al. (2017). **In situ functional dissection of RNA cis-regulatory elements by multiplex CRISPR/Cas9 genome engineering.** Nature Communications, 8(1), p.2109.

Ferry, Q. R. V., et al. (2017). **Rational design of inducible CRISPR guide RNAs for de novo assembly of transcriptional programs**. Nature Communications, 8, 14633.

Ferry, Q. R. V., et al. (2014). **Diagnostically relevant facial gestalt information from ordinary photos**. eLife, 3, e02020.

Ferry, Q. R. V., & Fulga T. A., **Inducible guide RNAs for genome editing.** United Kingdom Patent App. 1700460.7 & US Patent App. 16/476,989

Recognition

MIT Infinite Expansion Award (2020) – MIT,
awarded to postdoctoral researchers for scientific excellence.

Picower Fellowship (2019) – Picower Foundation,
2 years postdoc salary & research grant.

Radcliffe Department of Medicine Graduate Prize (2017) – University of Oxford, awarded for research excellence.

Ita Askonas Medal (Runner-up) (2017) – The MRC WIMM, University of Oxford, awarded for best PhD presentation.

Ralph A. Lewin Prize (2017) – St Cross College, University of Oxford, awarded for best PhD project in medical sciences.

Wellcome Trust DPhil studentship (2013) – Wellcome Trust,
4 years PhD salary & research grant.

Professor Sir Michael Brady Prize (2012) – University of Oxford, awarded for best individual project in biomedical engineering.

Competences (relevant to ML research only)

Deep learning courses & accreditations: (i) *DeepLearning.AI* - complete deep learning specialization (credit, 2019), ; **(ii)** *UC Berkeley* - designing, visualizing and understanding Deep NN (auditing, 2021); **(iii)** *Deepmind* - Reinforcement Learning Series 2021 (auditing, 2021).

Familiar with: Classical DL architectures (MLP(FF), CNN, RNN, NLP, transformers), model training & optimisation (SGD, regularization, hyperparameter tuning, etc), applications (RL, vision, NLP, GAN, VAE). Unsupervised learning & Data analysis (PCA, tSNE, MDS, etc.).

Programming languages: Python (numpy, pandas, pytorch, matplotlib), R, Matlab (also Java, Javascript, CSS, HTLM, MySQL).

Scientific communication (i.e., manuscripts, posters & talks) (Proficient in all Office softwares and Adobe illustrator); **Fluent in English and French**.