CRAIG A. GLASTONBURY

craig.glastonbury@benevolent.ai
15 Burdell Avenue, Oxford
My Google Scholar

WORK

BenevolentAI *Sept 2018 - Present*
Senior Machine Learning Researcher

· Biology/Healthcare team.

University of Oxford *March 2017 - Sept 2018*
Postdoctoral Researcher

· Developed a deep learning pipeline (RetinaNet & Ensemble CNN) to localise and classify cells in placenta histology - Expanding analysis to 8500 placenta samples. paper here.
· Developed an automated cell size estimator (Dilated U-net implementation) to quantify millions of cells from histology imaging data.
· Inception-like CNN to count cells in histology slides. ICCVW paper here.
· Working on fair classifiers and regressors for confounded biological imaging datasets using adversarial training.

Deloitte UK *2012 - Sept 2013*
Ethical Hacker / Penetration Tester

· Security cleared by the Ministry of Defense (MoD). Penetration tester of networks, web applications, mobile applications and social engineering for several FTSE100 companies, government agencies and departments.

EDUCATION

PhD Statistical/Computational genomics *Sept 2013 - 2016*
King's College London

· My PhD was focused on using statistical and computational methods to understand the genetic control of gene expression in humans and how genetic variation that modulates expression influences cardio-metabolic traits and obesity.

BSc Mathematics *March 2016 - Present*
The Open University

· Whilst studying and working full time as a Postdoc I am entering the second year of an undergraduate mathematics degree, part-time. Current modules cover Pure Mathematics - e.g. Vector Calculus, Group & Number theory.

BSc Biological sciences *March 2009 - 2012*
Imperial College London

· Specialised in Genetics and Statistics.

SKILLS

Computer Languages	Python, R & Javascript
Software & Tools	Pytorch, Keras, Tensorflow, sklearn, e1071, LaTeX, Maxima.

INVITED TALKS

Vertex Pharmaceuticals Sept 7th 2018
Abingdon, Oxford

· Deep learning and its applications to medical imaging.

King's College London 2015
RNA-Seq workshop

· Deconvolution of Adipose tissue cell type composition using RNA-Seq with Support Vector Machines.

GITHUB/ML IMPLEMENTATIONS

DenseNet and DenseNet-BC implementation. I implemented DenseNet and applied it to the CIFAR10 dataset. The test error is lower than the original DenseNet paper. Implementation here.

U-net/Dilated U-net implementation - I have used this in currently unpublished work to segment 13.5 million cells from histology imaging data. Publicly, I have also applied it to the Cell Tracking Challenge Dataset (ISBI) - ranking in the top 100 academic submissions (68th). Implementation here.

Nature Conservancy Kaggle competition - Classification task of 8 species of fish, imaged from cameras on fishing traulers. Used Overfeat (a bounding box regression CNN) and also built an InceptionV3 pre-trained network and ensembled it with a ResNet50 to obtain a private leaderboard score of 30th/2293. Implementation here and blog here.

Intel Cervix type - Kaggle Competition - Trained both a localisation (bounding box) network (YOLO9000/darknet) and several pre-trained deep nets to classify different types of cervix's to improve cervical cancer diagnosis. Obtained a private leaderboard score of 18th/848. Implementation here and blog here.

ADDITIONAL TRAINING/COURSES

Kaggle competition 'Master' (top 0.7% overall - 507th/70,500). Kaggle is a world leading machine learning competition website in which companies provide data and problems for the kaggle community to solve. Competitions I have participated in include fish species detection from hauler boat video footage, lung cancer nodule detection and prediction from CT scans, cervical cancer type classification and assessing duplicate questions from the Quora database

Machine Learning MRes module (2016) - King's College London. Course covering machine learning, probability and statistics. Taught by Professor Giovanni Montana

Lisbon Machine Learning Summer School (LxMLS, 2017). Selected to participate in a highly competitive machine learning school/conference co-sponsored by Google.

Learning From Big Data - University of Oxford Doctoral Training Program. Course taught by Andrew Zisserman covering SVMs, kernel trick, Deep learning (ANNs,CNNs, autoencoders, generative models).

TEACHING/MENTORING

Jonas Bovijn (DPhil - 2017-2020) (Christ Church) - Using genetics and genomics to improve drug target validation.

Peter Strain (DPhil - 2017-2020) (St Annes) - The genetic basis of placenta histology. Deep learning applications for cellular phenotyping

AWARDS

Genetics Society Junior Scientist Conference award - 2017 - Awarded funding to attend the Lisbon machine learning school (LxMLS)

Genetics Society Junior Scientist Conference award 2016 - Awarded funding to attend the American Society of Human Genetics (ASHG16)

Hackseq 2016 - Selected to attend and participate in a genomics hackathon at the University of British Columbia, Vancouver. Over a weekend our team came up with a method to optimize parameters for genome assembly https://f1000research.com/articles/6-197/v1

American Society of Human Genetics (ASHG15) - Reviewers Abstract award (Top 10% of abstracts submitted)

American Society of Human Genetics (ASHG15) - Selected for ASHG Poster highlight in the cardiometabolic trait section (Top 3% of abstracts)

Leena Peltonen School of Human Genetics (2015) - Selected as 1 of 20 students to attend a highly competitive school in which students are selected on merit to present to, and network with, 20 world leading professors in the field of human genetics.

PLATFORM PRESENTATIONS

ASHG Platform Presentation, 2016 - Adiposity-dependent interactions on multi-tissue transcriptomes

Quantitative Genomics 2014 & 2015 Presentation - Detecting gene by environment interactions on expression in multiple tissues (Quantitative Genomics 2014/2015)

King's College London RNA-Seq day - Deconvolution of Adipose tissue cell type composition using RNA-Seq (Invited speaker - 2015)

POSTER PRESENTATIONS

ASHG 2017 - In-silico characterization of cell-type composition in adipose tissue: implications for omic analyses and associations to adiposity measures

ASHG 2016 - Population level variability in adipose tissue cell type composition

King's College London RNA-Seq workshop - Deconvolution of Adipose tissue cell type composition using RNA-Seq (Invited speaker - 2015)

ASHG 2015 - Adiposity dependent regulatory effects on multiple tissue transcriptomes - Glastonbury et al., (ASHG Poster presentation, 2015)