Cameron Shand

cameron.shand@manchester.ac.uk | sea-shunned.github.io | sea-shunned | cameronshand | Feb 2020

Education

Strong interdisciplinary educational background in machine learning, optimization, engineering, and life sciences

University of Manchester

Manchester, UK

PhD Computer Science (4-year CDT; EPSRC-funded) *Sept. 2015 - Dec. 2019*

Title *Evolutionary algorithms in clustering: Challenging problem generation and search space adaptation*

Topics Clustering, evolutionary computation, multi-objective optimization, search space adaptation

Projects HAWKS (`https://hawks.readthedocs.io/`)
Adaptive-MOCK

Leadership Supervised two MSc disserations
Supported and advised fellow PhD students as a **PGR Mentor** and **CDT representative**

UCL (University College London)

London, UK

First Class (hons) MEng Biochemical Engineering with Bioprocess Management *Sept. 2010 - July 2015*

Topics Mathematical modelling, biochemistry, economic appraisal, plant design, project management

Project *The Challenges Facing a Stem Cell Therapy to Restore Cardiac Function Following an Acute Myocardial Infarction*

Leadership Treasurer of Biochemical Engineering undergraduate society

Professional Experience

Broad range of international experience in the machine learning and pharmaceutical sectors, with an extensive experience in data analytics and consulting

IBM Research

Warrington, UK

Research Intern *Feb. 2019 - May 2019*

- Created **explainable ML framework** for analysing **metagenomic data** to predict disease status
- Framework handled pre-processing, parameter search etc., using a variety of models of varying complexity, from random forests to XGBoost to neural network ensembles
- Designed **feature engineering** and pre-processing for **patient data** from several **longitudinal studies**
- Presented promising results to client, highlighting protective and causative bacterial species through explainable ML

University of Manchester

Manchester, UK

Consulting Data Scientist (paid) *May 2017 - PRESENT*

- Virtuoso: Learning from professional violinists using biometric data
  - Invited to collaborate in an early-stage project that received seed funding to **assess technical and commercial feasibility**
  - **Analysed noisy temporal data** from a wearable device to measure differences between expert and amateur violinists
  - Assisted with seeking further funding to continue the project and to outline the next technical and theoretical steps
- **BAE Systems** workshop
  - Invited to Data Science workshop to provide expertise on ML and optimization problems
  - Presented actionable next steps needed to implement identified solutions

AggioSergeant

London, UK

Data Analyst *Sept. 2014 - July 2015*

- **Sourced candidates where previous companies had failed to deliver** with challenging client requirements
- Designed workflows and training materials for tracking and managing candidates in a central database
- Amassed and analyzed internal data to provide statistics for prospective clients

Roche *Basel, Switzerland*

Intern *Aug. 2013 - July 2014*

- Designed new pilot-plant, liasing with engineering, architecture, project management, and legal departments to ascertain the complex requirements
- Given a **formal approval with a £5mil budget after 4 months**, despite being given the full 12 months to complete the task
- Validated and programmed an automated liquid-handling platform
- Created various VBA tools for automated analysis

Teaching Experience

Taught machine learning, data analytics, programming, and statistical methods at undergraduate and Master's level

University of Manchester *Manchester, UK*

Graduate Teaching Assistant (GTA) *Sept. 2016 - PRESENT*

- Demonstrated for *Programming in Python for Business Analytics*, *Data Engineering*, *Foundations of Machine Learning*, and *Modelling and Visualization of High Dimensional Data* Master's modules
- **Head GTA** for *Data Engineering* — coordinated other GTAs, moderated marking, and **delivered weekly 1-hour tutorials**
- Delivered material for *Fundamentals of Data Analytics* and *Business Data Analytics* undergraduate modules
- Nominated for teaching award

Coursework Design *Sept. 2017 - PRESENT*

- **Designed programming coursework** for *Programming in Python for Business Analytics*
- Re-designed coursework material for *Understanding Data and their Environment*
- Updated coursework for *Data Engineering* to incorporate **recent developments in supervised/unsupervised learning**

Skills

Programming	Python **>>>** R & LaTeX **>** MATLAB **>** Bash, C++
Concepts	Clustering, dimensionality reduction, multi-objective optimization, statistical testing, deep learning, explainability, OOP, unit testing, supervised learning, ensemble learning
Tools/Libraries	Git, numpy/scipy/matplotlib/pandas etc., TensorFlow, DEAP, SHAP, ELI5
Languages	English (native) & German (CEF A2)

Publications

Evolving Controllably Difficult Datasets for Clustering

Cameron Shand, Richard Allmendinger, Julia Handl, Andrew Webb, and John Keane

In GECCO'19: Genetic and Evolutionary Computation Conference, July 15–19, 2019, Prague, Czech Republic. ACM, New York, NY, USA, 8 pages. https://doi.org/10.1145/3321707.3321761

N.B.: **Nominated for a best paper award.**

Towards an Adaptive Encoding for Evolutionary Data Clustering

Cameron Shand, Richard Allmendinger, Julia Handl, and John Keane

In GECCO'18: Genetic and Evolutionary Computation Conference, July 15–19, 2018, Kyoto, Japan. ACM, New York, NY, USA, 8 pages. https://doi.org/10.1145/3205455.3205506

N.B.: GECCO is a CORE2018 A-ranked conference.

Academic Activities

Session Chair	IEEE CIBCB 2017, GECCO 2019
Reviewer (Conferences)	GECCO 2020, IEEE CIBCB 2020
Reviewer (Journals)	IEEE Transactions on Evolutionary Computation
Panels	AMBS Doctoral Conference, EASTN-DC Research Session
Posters	Advances in Data Science 2019