

Dean Rance

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EDUCATION

University of Cape Town

MSc in Applied Mathematics

A research-only masters on using evolutionary algorithms to design spiking neural networks which solve reinforcement learning tasks.

Cape Town

Currently Enrolled

IBRO-Simons Computational Neuroscience Imbizo

Summer School

A summer school organised by UCT, UCL and Oxford.

Presentation: Biological Models of Synaptic Plasticity

Cape Town

January 2018

University of Cape Town

MPhil in Financial Mathematics and Risk Management

A coursework and minor dissertation masters programme. Coursework complete.

Relevant Subjects:

- Stochastic Calculus
- Numerical Methods
- Risk Management
- South African Financial Markets

Cape Town

Incomplete

University of Cape Town

BSc (Hons) in Mathematics - First Class Pass

Project: Optimizing Information Transfer in Noisy Neural Networks

Cape Town

June 2016

University of Cape Town

BSocSci in Mathematics and Philosophy - Distinction in Mathematics

Cape Town

November 2014

WORK EXPERIENCE

Freelancer

Data Scientist

- Building, evaluating and facilitating incorporation of machine learning and deep learning models
- Reviewing academic publications for up-to-date methodologies
- Building natural language preprocessing pipelines
- Exploratory data analysis and cluster analysis

Cape Town

October 2017 - Present

WhereIsMyTransport

Data Scientist and Researcher

- Core part of Research and Development team
- Prototyping and extending projects as presented in academic publications
- Algorithmic research, particularly graph theoretic
- Using optimisation software to resolve NP-hard prototypes
- Exploratory data analysis and cluster analysis
- Supervised and Unsupervised Learning
- Simulation, including Monte Carlo methods with pseudo-random sampling

Cape Town

November 2014 - August 2017

COMPETITIVE EXPERIENCE

Barclays

Data Wars Hackathon

Team Placed Second Nationally

Used random forest to predict success of NAEDO (Non-Authorised Electronic Debit Order) hits

Cape Town

October 2015

KEY PROJECTS

Document Feature Extraction

AppStrax Technology

A natural language processing pipeline allowing for interactive clustering, summarisation and analysis of text corpora.

- Collocation Extraction
- Topic Modeling
- Sentiment Analysis
- Key-Word Extraction, Graph-based Summarisation
- Word Embedding

Analysis of Text Corpora

AppStrax Technology

Tools to analyse and interact with datasets incorporating text, such as forums or surveys with custom responses.

- Dimensionality Reduction
- Multiple Correspondence Analysis
- Collaborative Filtering
- Information Retrieval
- Gaussian Mixture Models

Automated Map Drawing

WhereIsMyTransport

A Windows forms based interactive tool which extracts GeoJSON route data of a public transport provider and automatically draws a London-Underground-styled metro map.

- Mixed-Integer Linear Programming
- Hill-Climbing Optimisation

Estimating Vehicle Arrival Time

WhereIsMyTransport

Machine learning regression to estimate the arrival time of a public transport vehicle at downstream stops on its route.

- Neural Networks
- Support Vector Machines
- k-Nearest Neighbours

Vehicle Trajectory Routematching

WhereIsMyTransport

A classifier for determining which public transport route a vehicle is traveling on from recent GPS trace.

- Hidden Markov Models
- Expectation-Maximisation Parameter Optimisation
- Monte Carlo Simulation

TECHNICAL STRENGTHS

- **Programming Languages:** Python, C#, MATLAB/Octave, SQL, Cypher
- **Python Machine Learning:**
 - Deep Learning: Keras, Tensorflow, PyTorch
 - Natural Language Processing: NLTK, Gensim, SpaCy
 - General Learning: Scikit-Learn, Scikit-Surprise, PuLP
 - Other Tools: Pandas, Dask, Matplotlib, Scipy, Numpy
- **Familiar Tools:** Jupyter, VSCode, Visual Studio, Git, AWS, Mendeley
- **Other:** Flask, Brian2

References Available Upon Request
