Yadu Raj Bhageria

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EDUCATION

IMPERIAL COLLEGE LONDON

MSci in Mathematics
2013 - 2017
1st Class Honours

Teaching Assistant
Chair & Committee Appointments

Key Modules
Scientific Computation
High Performance Computing
Computational Linear Algebra
Computational PDEs
Machine Learning
Bayesian Data Analysis

MILLFIELD SCHOOL

2007-2012
Arkwright Scholar
Academic Society President
Gold Duke of Edinburgh Award
British Mathematical Olympiad: Distinction

A-Levels
Further maths: A*
Maths: A*
Physics: A
Philosophy: B

AS-Levels
Economics: B
German: B

GCSEs
9 A*s, 2 As, 1 B

SKILLS

PROGRAMMING

Proficient
Python • Matlab • C

Intermediate
Fortran • R

TOOLS

Git • Maple • LaTeX

LANGUAGES

Fluent
English • Hindi

Intermediate
German

INTERESTS

TECHNICAL

Quantopian • OpenAI Gym

OTHER

Chess • Piano • Rock Climbing

EXPERIENCE

IMPERIAL COLLEGE LONDON | Research Assistant

Summer 2016 | London, United Kingdom

- Researched under Dr Prasun Ray in the Applied Mathematics department
- Developed a predictive model (in Python) based on behavioural heuristics for pedestrian flows that was verified against empirical data
- Quantified impacts of specific perturbations made to ordered states

SPORTSUNITY | Co-Founder

Summer 2013 | Delhi, India

- Designed the user flow & validated concepts during the ideation phase
- Conducted user research & ran pilots to identify key features
- Tracked user behaviour using analytics tool (Clevertap) to gain insights & make data driven decisions

PROJECTS

FORECASTING | Bayesian Data Analysis Research

Master's Disseration
Full title: Computationally Efficient Forecasting using Gaussian Processes utilizing large Datasets

- Supervised jointly by Dr Ben Calderhead, Statistics Department, & a leading volatility-based hedge fund, Boussard & Gavaudan
- Investigated state of the art Bayesian nonparametric statistical methodology for making time series predictions with full likelihood based inference
- Found a novel application of treating short intervals of data as replicates; this allowed use of large financial datasets to their maximum potential
- Presented the advanced mathematical ideas to a panel of academics & defended the findings introduced

NAVIER-STOKES IN AN ANNULUS | Computational PDEs

- Successfully simulated & researched the convection of fluid flow between two concentric rings to a very high resolution
- Converted finite difference schemes, e.g. Lax-Wendroff & Crank -Nicolson methods, into polar systems to solve advection & diffusion
- Implemented the full Multigrid method for a disk to accelerate the convergence of the Gauss-Seidel iterative method

IMAGE SEGMENTATION | Multivariate Bayesian Statistics

- Segmented RGB images using Gaussian mixture models
- Successfully performed object counting on segmented images using K-means, e.g. number of cells in an organism

FACIAL RECOGNITION | Statistical Machine Learning

- Correctly classified individuals in a set of facial images using K-means
- Applied principle component analysis for image dimension reduction
- Assessed model using 10-fold cross validation

PARALLEL PROCESSSING | High Performance Computing

- Created highly-efficient Python functions for solving the Poisson equation using Fortran, OpenMP & OpenMPI
- Assessed the speedup gained from using different methods of multi-threading

REINFORCEMENT LEARNING | Machine Learning

- Investigated various techniques of reinforcement learning using the online OpenAI gym environments