Dr Alexander Shires

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An highly-motivated AI Architect, I design, build and operationalise products driven by machine learning algorithms and take data science-based projects from prototype to production. I'm currently part of the AI Engineering team at Deloitte UK, working in the Financial Services sector. Prior to Deloitte, I spent six years as a researcher at Imperial College London, CERN & TU Dortmund, delivering scientific projects using the petabytes of data collected by the LHCb CERN experiment.

Key Skills: Solution Architecture, Data Science, Consulting, Data Engineering, Statistics, MLOps

Employment History

Deloitte, UK

Manager, AI Engineering, Consulting *Sept 2015 to present*

Roles: Solution Architect, Data Science Lead, Senior Machine Learning Engineer, Site Reliability Engineer

2020-, Financial Services: Cloud-based architecture and product development. Leading teams to design, architect and build enterprise platforms on GCP and AWS for disruptive retail banking, general and life insurance propositions. Expert advisor for AI-driven enterprise architecture within the firm and data science expert advisor for algorithm design and development. Promoted GCP development and training within the firm, demonstrating potential for future FS projects.

2019-2020, Heathcare and Life Sciences: Lead solution architect and designer for a AWS-based enterprise platform delivering secure, scalable cloud-based R&D capabilities using a combination of cloud-native and open source technologies. Responsible for the solution blueprint, key technology and enterprise decisions, working with IT and Architecture boards to solve stakeholder challenges around on-prem to cloud migration, networking, security and data management. Delivered a production solution as part of an agile team that went live in early 2020.

2017-2019, Digital Banking: Responsible for architecting and delivering a secure, scalable machine-learning enterprise platform on AWS for a disruptive digital banking application aimed at the UK personal banking market. Led a team of up to 20 data scientists, engineers and analysts, working in an agile software-development lifecycle with both cross-functional and platform teams. Was also responsible for ongoing performance and scalability of the application, where I oversaw and performed production interventions, ran statistical analysis and forecasting on operational metrics, and advised, managed and implemented changes with a cross-functional team to improve the overall system performance.

2015-2017, Insurance: For the General Insurance industry, I built geospatial and IoT data processing platforms on AWS and GCP across personal and commercial insurance for motor and property sectors. Worked with major insurance companies to run InsurTech pilots and determine how best to disrupt the UK insurance market. Developed multiple machine learning algorithms for risk analysis, with a focus on geospatial, commercial and open data.

TU Dortmund, Germany, Imperial College London, UK & CERN, Switzerland

Post-Doctoral researcher, High Energy Particle Physics *Jun 2013 to Aug 2015*

Role: research, data analysis, software engineering, operations, project management, communication

Lead analyst: *arXiv:1406.6482*. Responsible for investigating the LHCb data for two rare signals with potential for ground-breaking results, one never previously modelled. I developed new models to describe the data and implemented all the calculations in a single framework. As a result, the measurement was 50% more precise than expected and is one of the highest profile results from the LHCb experiment with over 1000 citations.

Skills

Software Languages: Python, C++ (proficient), PySpark, Scala, Fortran, SQL, R (intermediate), Java, Go (basic)

Data Science: numpy/scipy/pandas, scikit-learn/tensorflow/keras, flask, pytest, boost/gsl

Frameworks & Tools: Apache Airflow, Docker, Luigi, Spark, Spark Streaming, Kafka, Kubernetes

Cloud Platforms: *GCP stack* incl. GKE, DataProc, DataFlow, PubSub, AI Platform, CloudComposer. *AWS stack* incl. EKS, SageMaker, EMR, Kinesis. *Azure*: incl. DataFactory, Functions

Databases: Hadoop/Hive, ElasticSearch, DynamoDB, BigQuery, MongoDB, MySQL/MSSQL

Computing: Windows, OSX, Linux, Git, SVN, cmake, MS Office, LaTeX, Vim, Tableau

Languages: English (native), German (conversational)

Education

Imperial College London, UK

PhD, High Energy Physics *Oct 2009 to Oct 2013*

Research PhD including an 18 month placement at CERN, Geneva. I delivered a range of projects covering detailed analysis of data collected at LHCb, built software frameworks to support large-scale scientific simulation efforts, development of high frequency data processing software, and detection and precision measurements of extremely rare particles.

Analyst: *arXiv:1304.6325*. As part of a small team working for the LHCb collaboration, I worked on a project which had high potential to break new scientific ground. For this team, I developed and maintained a correction algorithm to translate recorded, distorted particle collision data back to a truer representation. We delivered an accurate result to deadline and this was the first major result from LHCb in 2010.

Imperial College London, UK

MSci (First Class Hons), Physics With Theoretical Physics *Oct 2005 to Jun 2009*

First Class degree with a specialisation in the more mathematical core topics within Physics. My specific focus into fundamental particle physics and cosmology, covering key corses in applied mathematics, statistics and computing.

Additional experience

Westinghouse Rail Systems, Wiltshire, UK

Junior engineer *Summer 2006 & 2007*

As a scholarship given to the top three students from local schools, worked as the sole data analyst for the first live railway trial of a multi-million pound project. Invited back for a second year to develop software in C++ on Windows to test the integration of a new railway track-side communications protocol.

Interests

My interests cover everything from music and cricket to long-distance running and cycling. I play the trombone to a high standard and have played in orchestras and jazz bands in London, Geneva and Dortmund. Alongside my music, I play regular amateur cricket with a team based in south-west London. Outside of the cricket season, I train for endurance running and cycling events in my spare time.

References

Available on request