CURRICULUM VITAE - Matthew John Livesey

Introduction

I am a Senior Software Engineer and Architect with a wide range of expertise and a passion for understanding and mastering new technologies and methods. I specialize in Big Data solutions based on the Hadoop eco-system and scalable, reactive applications using Scala frameworks such as Akka and Spark.

With respect to Hadoop, I have worked with the Hortonworks HDP platform, the Cloudera CDH Platform, and Elastic MapReduce, the Amazon cloud Hadoop solution. I have extensive experience installing and tuning Hadoop, developing applications for it, and integrating it with other systems, including Postgresql, MongoDB and SQL Server.

I have extensive knowledge of Apache Spark, including working with it at a low level to produce custom integration with third party data sources.

I have experience of developing Actor based systems using Akka and associated libraries such as Spray and Akka-persistence. I have experience using Slick to integrate Scala applications with Database systems.

I am an advocate of using Docker to package and deploy applications as containers, and have experience connecting containers across multiple hosts.

Throughout my career I have prioritized the personal and professional development of myself and others, having been actively involved in the recruiting and training of new graduate joiners and acting as a mentor to new team members.

Key Technology Skills

Programming Languages: Scala, Java, Python, Bash Shell, JavaScript, SQL, PL-SQL

Scala libraries: Spark, Akka, Spray, Play, Slick

Databases: Hive, PostgreSQL, MongoDB, MySQL

Hadoop related tools: HortonWorks, Elastic MapReduce, Hive, Sqoop, Oozie, Pig, Knox, Ambari

Operational Tools: Docker, Amazon Web Services

Certifications and Memberships: 'Functional Programming Principles in Scala', online course from École Polytechnique Fédérale de Lausanne, Member of the British Computer Society (2008 – Present)

Professional Experience

January 2016 – Present. Spark Software Engineer at Dunnhumby. Lead developer on an initiative to integrate Apache Spark with a proprietary in-house database. This involved writing custom optimizers for Spark SQL to translate Spark execution plans into calls to the proprietary system, which required in-depth exploration and understanding of the internal workings of Spark. Also involved in training analysts on using Python to interact with Spark. During this project, took part in planning the organisation's overall strategy to Big Data, providing insight from previous experience to determine the appropriate tools and methods to solve the organisation's data challenges.

June 2015 – January 2016. Scala Software Engineer at Dunnhumby. Part of a small development team working on a reactive analytics application developed using Akka and Spray. Responsibilities included developing components to integrate Akka based micro-services using REST, components using Akka Persistence to store and

replay event driven data, and using Slick to persist data from Actors to a Postgres Database. Developed an sbt plugin to automatically launch the various components as Docker containers and run integration tests against them. Used Autowire to implement client-server communication in the web layer using Play and Scala.js. This project followed Kanban methodology.

February 2015 – May 2015. Big Data Consultant at Barclays Bank. This project aimed to set the strategic direction for Big Data within the bank, based on a foundation of the Cloudera Hadoop distribution. This role required the exploration of a wide range of technology options, with the most promising options being adopted into the core architecture. One particular contribution was devising a solution for deploying Hadoop and other products on an architecture of Docker containers managed by Mesos, an emerging cluster resource management technology. This was developed as an alternative to traditional public or private cloud options. It was shown that this first of its kind approach to deploying Hadoop within containers provided a viable and efficient method for sharing the resources across a cluster of physical machines, when compared to traditional virtualisation. I also developed a solution for automatic installation of Cloudera's Hadoop distribution on both the Google and Amazon clouds.

I was responsible for developing software in Scala and Python, and producing a cookbook of working examples to be used by clients of the core architecture, which required my experience with a wide range of Hadoop components and methods, including Scalding, Spark, MapReduce, Hive, Sqoop and Flume. This project followed SCRUM methodology.

October 2014 – January 2015 Big Data Consultant at Strainstall Monitoring. Sole responsibility for the design and delivery of a Hadoop (Hortonworks) based data warehouse storing the output of sensors generating hundreds of gigabytes of data per day, relating to monitoring the structural health of a large transport infrastructure project in the United Kingdom. This included designing a suitable data storage method in Hive to handle OLAP workloads, integration of Hadoop with a custom Python-based Web User Interface and a Postgresql database, and building several custom components using Hive, Oozie, Sqoop and other Hadoop tools.

October 2013 – October 2014 Solution Architect and Developer at Telefonica Digital. Reporting into the Enterprise Architect for the SmartSteps project. This role included a significant amount of hands-on development work as well as architecture work. I was responsible for the architectural transition during a pivotal stage of the project. This involved moving from an end-to-end fixed-function Hadoop pipeline based on Java to a new analytics platform using cutting edge Scala/Spark big data technology to process data and present it to an analytical Data Warehouse. I led the prototype-driven testing of several database technologies including Apache Hive, HP Vertica and Exasol, before ultimately selecting PostgreSQL as the most appropriate choice for the Data Warehouse layer. I implemented the Database structure for holding the analytical data, and several components for importing data. My contributions during this role also involved the development of software components in Scala, Java and Hive. I was part of a development team with a key focus on achieving quality through iterative sprints, Test Driven Development, and code reviews.

2005 – 2013 Technology consultant at Accenture. Joined as a graduate technology consultant, progressed to project manager/technology architect having experience on a wide range of client engagements across business sectors including Banking, Energy and Mobile Communications. After returning from a year of absence to study in 2011, focused on Big Data solutions.

Academic Experience

2011 – MSc Computer Science with Multi-Core Computing with Distinction from University of Manchester.

This course focused on the latest technologies for parallel and distributed computing including hands on experience with general purpose computing on GPUs, and CPU streaming, for which I received several publications (listed below). During this period of study, I developed a passion for delivering the maximum performance from available hardware, which I consider to be a key skill in delivering efficient and cost effective solutions. At the conclusion of this course I was awarded the Peter Jones Memorial Prize for highest performer in the year.

2005 – BEng Software Engineering (1st Class Hons) from University of Manchester.

This was a wide-ranging course covering the technical aspects of software development (mainly in Java) and the functional aspects of project planning and delivery. I was awarded the school prize for highest score in Software Engineering.

Publications:

Livesey, Matthew, Fumie Costen, and Xiaoling Yang. "Double precision performance of streaming SIMD extensions instructions for the FDTD computation." *Antennas and Propagation Society International Symposium (APSURSI), 2012 IEEE*. IEEE, 2012.

Livesey, Matthew, Fumie Costen, and Xiaoling Yang. "Performance of Streaming SIMD Extensions Instructions for the FDTD Computation. "*Antennas and Propagation Magazine, IEEE* 54.3 (2012): 160-168.

Livesey, Matthew, et al. "Impact of GPU memory access patterns on FDTD." In *Antennas and Propagation Society International Symposium (APSURSI), 2012 IEEE*, pp. 1-2. IEEE, 2012. "Impact of GPU memory access patterns on FDTD." *Antennas and Propagation Society International Symposium (APSURSI), 2012 IEEE*. IEEE, 2012.

Livesey, Matthew, et al. (2012). Development of a CUDA Implementation of the 3D FDTD Method. *Antennas and Propagation Magazine, IEEE*, *54*(5), 186-195.

References

Available on request.

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