Lakshitha de Silva

PhD, MSc

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SUMMARY

Proficient and experienced software engineer with proven leadership skills spanning over two decades of industry exposure. Passionate programmer, computer scientist, technologist, and lifelong learner. Self motivated and takes pride in building high-quality software solutions. Exercises unwavering integrity and retains a strong work ethic. Adopts an engineering philosophy grounded in simplicity, gradual refinement, continuous delivery, and striking a balance between novelty and business value. Has a bias for action and influence, while leading by example. Competent guiding globally distributed software engineering teams. Enjoys mentoring and sharing knowledge. Thrives in environments that support autonomy, stimulate creativity, encourage diverse viewpoints, and enable strong collaboration.

TECHNICAL COMPETENCIES

Core Expertise

- Software engineering and software architectures, including architectural patterns and modelling
- Distributed systems, microservices and related communication styles such as REST and RPC
- Scaleable, performant, resilient, observable, secure and evolvable system design
- Modular, component-oriented software and API design
- Algorithms, data structures and multi-threaded programming
- Software containerisation and orchestration, with an in-depth knowledge of container technologies
- System software, from hardware level to higher abstractions
- Infrastructure-as-code (IaC), DevOps and engineering processes automation
- Testing distributed systems, including performance and contract testing
- Troubleshooting, technical problem solving and real-time debugging of critical production issues
- Agile software development and delivery
- Technical leadership, including leading globally distributed teams
- Product and commercial stakeholder collaboration
- Mentoring and building technical capacity of software engineering teams

Technical Skills

- **Programming**: Java (8 - 23), Go, C, Python (novice), C++ (dormant)
- **Cloud**: AWS, OpenStack, GCP (basic)
  - **AWS**: EC2, S3, Lamda, CloudWatch, API Gateway, RDS, CloudFront
  - **Openstack**: Compute and Networking services
  - **GCP**: BigTable/BigQuery
- **Cloud-native infrastructure**: Kubernetes, Docker/Linux containers
- **LLM/AI integration**: Claude/Anthropic LLM
- **Data/Event streaming**: Kafka (Core, Connect, Plugins), Splunk, Fluentd/FluentBit
- **RDBMS/NoSQL**: MySQL, DynamoDB
- **Internet/Networking**: HTTP, XMPP, HLS, Websockets, TCP/IP
- **IaC/DevOps**: Ansible, Terraform, Linux
- **Distributed caching**: Hazelcast, Redis
- **Messaging**: ActiveMQ
- **Security**: JWT, SASL, SAML, cryptographic encryption and hashing
- **Observability/Distributed tracing**: Dyanatrace, Grafana, Splunk
- **Process support tooling**: GitHub, CI/CD tools, SonarQube, NexusIQ, Artifactory
- **Other**: JVM, Linux internals, virtualisation, domain specific languages (DSLs), parsers, CPU architectures

Supplementary Technical Skills

- Strong technical writing and documentation ability
- Strong ability to conduct independent research
- Ability present deep technical topics to non-technical and other diverse audiences
- Strong code reviewing skills supported by years of programming in different languages

PROFESSIONAL EXPERIENCE

2015 – 2023 **Bally's Interactive (formerly Gamesys), London, UK**

Staff Engineer (Technical Lead) / Principal Engineer

Hands-on Technical Lead and secondary Technical Architect to Community, an agile team comprising backend and frontend developers building the chat and video streaming platform of this leading online gaming operator. I also provided architectural and technical guidance to engineering teams in the UK, Estonia and Malta. Worked closely with executive leadership to define product and technical strategies including roadmaps.

Key achievements:

- Designed a scalable and cloud-native event streaming solution to capture both backend and browser-based application events and process them through a unified Kafka pipeline. This was implemented on AWS.
- Formulated the technical strategy for migrating Community team's services to Kubernetes in an incremental manner with no interruptions to feature delivery and minimal impact to users.
- Fully automated the provisioning of Community team's integration testbeds, build environments, pipelines, and release dashboards using Ansible and Terraform on Openstack cloud infrastructure.
- Became subject matter expert for XMPP within the business. I was able to design a domain specific language and a corresponding compiler/executor for scenario testing and distributed load testing of XMPP servers.
- Containerised the Openfire XMPP server before Docker support was available, and helped the team migrate all backend and front services to Docker containers.
- Fixed serious clustering and instability issues in Openfire that were causing significant business impact and player discontent. All fixes were submitted to the official Openfire codebase.

2014 – 2015 **University of St Andrews, UK**

Scientific Officer

Contributed to the EPSRC funded project for researching reproducibility of scientific experiments. I was involved in building a framework with Vagrant and Microsoft Azure for archiving and reproducing computational aspects of science experiments.

Key achievements:

- Built and published an Azure VM Image to use as the base image for reproducible scientific experiments.
- Reworked the entire project website and content repository using Drupal.

2009 – 2013 **University of St Andrews, UK**

PhD Researcher / Tutor

The main work of my PhD involved building an extensible framework in Java to monitor design violations of Java applications at runtime. While JDPA was used to capture certain JVM events, dynamic bytecode instrumentation helped collect high-volume events to minimise the performance impact on the target software. Extensive object caching, multi-threading, thread pooling and domain sockets were utilised to further improve performance. A compiler for the Grasp architecture description language was also built in Java.

Key achievements:

- Published a widely cited survey and a classification framework for controlling software architecture erosion in the Journal of Systems and Software.
- Published three (3) research papers at top tier international conferences on software architecture.
- Designed a conceptual framework that maps architectural concepts to concrete programming constructs.
- Conceived the notion of *conformance rules* for encapsulating primitive constraints derived from architecture properties and their mappings to the code. Conformance rules can be validated against static or executing code to detect areas of the implementation deviating from the prescribed architecture.
- Created the Grasp Architecture Description Language (ADL) that has a novel syntax for mapping architecture properties and constraints to implementation.
- Built a Java agent that injects non-persistent, unobtrusive and high-performance instrumentation probes into a JVM to capture application telemetry required for validating conformance rules.
- Implemented an extensible framework in Java for monitoring architecture conformance of an executing Java application. The framework does not require the source code or a debug build of the application, and accepts a Grasp specification of the architecture against which runtime conformance is checked.
- Acquired considerable knowledge of inner workings of the JVM and Java bytecode.

PROFESSIONAL EXPERIENCE (Cont)

2001 – 2008 **Virtusa Corporation, MA, USA**

Senior Software Architect / Technical Lead

Worked in the role of Consultant Software Architect and Technical Lead with the following enterprise clients:

- **AspenTech, MA, USA**
  Lead architect to a team of senior technical architects who conducted a detailed architectural analysis of a large enterprise-class system catering to the petroleum industry. The analysis was executed using the ATAM process to uncover possible performance, scalability and other issues in the system architecture, after which recommendations were made to address weak points in both the architecture and the implementation.
- **SkillSoft, NH, USA**
  Provided hands-on technical leadership that included giving architectural and implementation guidance to a team of over 70 engineers located in US, India and Sri Lanka who re-engineered the *Dialogue* product suite. Also collaborated closely with product and technology executives to refine the company's product road map.
- **Cognition Financial (formerly First Marblehead), MA, USA**
  Provided architecture guidance to a team of senior architects and technical leads who were designing a new software solution to replace the legacy system that performed critical business functions.
- **Bowne & Company Inc, NY, USA**
  Was responsible for designing the *UBS Trust Kit Ordering* system using the .NET Framework and leading a team of 20 engineers while working closely with the technical and programme leadership at Bowne.
- **FTD, IL, USA**
  Designed a service oriented architecture (SOA) framework to host the next generation of FTD's floral delivery network and services on the .NET platform. Provided technical leadership to a team of over 30 engineers who developed applications in both Windows and Linux platforms.
- **Vericept Corporation, CO, USA**
  Was responsible for architecting the *Licence Management Server* solution using the IIS/ASP technology suite and leading a team of five engineers.
- **OpenPages, MA, USA**
  Provided hands-on technical leadership to a team of 20 engineers who were tasked with enhancing the *ContentWare* product that was implemented using the Win32/C++ technology stack.

Key achievements:

- The first software architect at Virtusa to lead a project with a Microsoft .NET Framework tech-stack. As the client was one of the first enterprise users of the technology, I worked closely with Microsoft engineers to troubleshoot bugs and pilot fixes in version 1.1 of the framework.
- The first software architect at Virtusa to lead a team of senior engineers who performed an assessment of a complex enterprise architecture using the Architecture Tradeoff Analysis Method (ATAM).
- Authored the first C/C++ programming standards and best practices document within the company, which served as the primary reference for C/C++ code reviews.
- Manager of an Individual Support Group (ISG) of over 20 engineers of different levels. In this role, I mentored, advised and supported their career development.

1996 – 2001 **Antawangi Systems Sdn Bhd, KL, Malaysia**

Software Development Manager / Architect

Designed and headed the development of a high-performance, multi-tiered content management and workflow routing software system that was implemented in C++ and based on the Windows NT/2000 platform.

1992 – 1996 **Ceylinco Consolidated Ltd, Colombo, Sri Lanka**

Systems Development Engineer

Designed and developed financial security systems based on biometrics & laser-card technologies using Visual C++ and Win32.

EDUCATION

2009 – 2014 **University of St Andrews, UK**

PhD in Computer Science

Thesis: ***Towards Controlling Software Architecture Erosion Through Runtime Conformance Monitoring***

Developed a novel concept for detecting violations of dynamic architectural constraints of software at runtime. Effectiveness of the theoretical model was demonstrated by building a non-intrusive framework to monitor design violations in running a Java application. While the JDPA API was used to capture certain JVM events, dynamic bytecode instrumentation was employed to collect high-volume events to minimise the performance impact on the software being monitored. Extensive object caching, thread pooling and asynchronous socket communication were utilised to further improve performance of the framework. A compiler and API for the Grasp architecture description language (ADL) were also developed as part of the PhD.

2008 – 2009 **University of St Andrews, UK**

MSc in Advanced Computer Science / Software Engineering

Passed with **Distinction**. Modules included Advanced Software Engineering, Advanced Artificial Intelligence, Advanced Networks and Distributed Systems, Software Architecture and Critical Systems Engineering.

Dissertation: ***A Rationale-based Architecture Description Language using the Oslo Modelling Platform***

1990 – 1994 **British Computer Society (The Chartered Institute for IT), UK**

BCS Part I & Part II Examinations

Subjects included Programming, Systems Analysis & Design, Fundamentals of Computer Technology, Digital Computer Organisation and Systems Architecture & Systems Programming.

Professional project: ***Television Programme Scheduling System*** for the state-run television station in Sri Lanka.

PUBLICATIONS

- PANDArch: A Pluggable Automated Non-intrusive Dynamic Architecture Conformance Checker
  Lakshitha de Silva and D. Balasubramaniam
  Proceedings of 7th European Conference on Software Architecture (ECSA 2013), pp. 240 – 248, 2013.
- Controlling Software Architecture Erosion: A Survey
  Lakshitha de Silva and D. Balasubramaniam
  Journal of Systems and Software, pp. 132 – 151, 2012.
- A Model for Specifying Rationale Using an Architecture Description Language
  Lakshitha de Silva and D. Balasubramaniam
  Proceedings of 5th European Conference on Software Architecture (ECSA 2011), pp. 319 – 327, 2011.
- Dominion: An Architecture-driven Approach to Generating Efficient Constraint Solvers
  D. Balasubramaniam, **Lakshitha de Silva**, C. Jefferson, L. Kotthoff, I. Miguel and P. Nightingale
  Proceedings of 9th IEEE/IFIP Conference on Software Architecture (WICSA 2011), pp. 228 – 231, 2011.

AWARDS

- SICSA Scholarship for PhD study, covering tuition fees and stipend, awarded by the Scottish Funding Council.
- Best PhD poster awards 2012, School of Computer Science, University of St Andrews.
- Best PhD poster awards 2013, School of Computer Science, University of St Andrews.
- Delivery Excellence Award 2003, FTD Project, Virtusa Corporation.

RESEARCH INTERESTS

- Security of software containers and microVMs
- Representing high-performance computing (HPC) paradigms in general purpose programming languages.

PROFESSIONAL AFFILIATIONS

- **Association for Computing Machinery (ACM), USA**
  Professional Member