DOMINIC LINDSAY

Research Engineer & PhD Candidate (Interested in Decentralised Resource Management Systems)

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Experienced and passionate Research Engineer with strong demonstrated history of working in both academic and software industries. Currently working towards a PhD of Computer Science. Research focused on development of novel resource management and scheduling policies for decentralised clusters. Strong experience of managing and deploying large scale distributed systems and infrastructure and Operating Systems development.

RESEARCH & PUBLICATIONS

[1] Dominic Lindsay, Ging-Fung Yeung, et al. "An Empirical Study of Inter-cluster Resource Orchestration within Federated Cloud Clusters". English. In: *2021 IEEE International Conference on Joint Cloud Computing (JCC)*. IEEE, Oct. 2021. ISBN: 9781665434805. DOI: 10.1109/JCC53141.2021.00019

[2] Dominic Lindsay, Sukhpal Gill, et al. "PRISM: An Experiment Framework for Straggler Analytics within Containerized Clusters". In: *WoC 2019 Fifth International Workshop on Container Technologies and Container Clouds*. ACM, Dec. 2019, pp. 13–18. ISBN: 9781450370332. DOI: 10.1145/3366615.3368353

PROFESSIONAL EXPERIENCE & PROJECTS

September 2017 — Present | Lancaster University | Associate Lecturer
Teaching and coursework development, as well as lecture development and delivery across Operating Systems, Networking and Distributed Systems.

September 2021 — Present | iwoca | Senior Software Engineer
Varied systems and software engineering role: Reducing AWS costs via development of ETL pipelines, observability tools and systems performance insights. Lead design & implementation of modelling framework from RFC to implementation, prescribing a model development workflow supporting continuous training, deployment and monitoring.

March 2021 — June 2021 | Unikraft | Research Engineer Internship
Internship object: Develop unikraft OCI compatible runtime and integration of a unikernel build, deploy and execute workflow to Kubernetes control plain. I also develop a package command capable of packaging unikernels as OCI compatible images.

June 2020 — September 2020 | Arm Research | Research Engineer Internship
Interned as part of Security Research team, contributed to two projects. Developed memory and capability management libraries for formally verified kernel. Development of distributed trusted computation platform enabling execution of applications amongst mutually distrusting peers.

EDUCATION

September 2017 — Present | Lancaster University | PhD Computer Science
Orchestration systems for decentralised infrastructures. Investigates impact of inter-cluster characteristics such as sporadic utilisation, cross cluster latency and workload affinity. Specifically focused on development of novel scheduling policies and resource management systems for federated systems.

October 2012 — June 2016 | Lancaster University | Msci Software Engineering (1st class honours)
Core Modules: *Software Design Studio — Part 1 & 2*, *Distributed Systems*, *Advance Distributed Systems*, *Operating Systems*, *Networking*, *Advanced Programming*, *Communication Systems*

LARGE SCALE INFRASTRUCTURE MANAGMENT

Reliability Engineering Responsible for management of large scale research cluster composed of over 100 heterogenous CPU/GPU nodes. Facilitating a wide range of research activities: machine learning infrastructure, development of orchestration systems.
Distributed Applications Development OCI Runtimes (runc, runu, runv, podman, docker), Kubernetes Container Runtime Interface, Containerd Shim development.

REFERENCES

PhD Supervisor Dr. Peter Garraghan (p.garraghan@lancaster.ac.uk),
PhD Supervisor Dr. Yehia Elkhatib (y.elkhatib@lancaster.ac.uk),
ARM Supervisor Nick Spinale (nick.spinale@arm.com)

AWARDS

- **Best paper award at IEEE JointCloud'21** – Award for best paper at IEEE Jointcloud'21. I received the highest scores for my work "An Empirical Study of Inter-Cluster Resource Orchestration within Federated Cloud Clusters"

SKILLS & EXPERTISE

Programming Languages: C, C++, Rust, GoLang, Lua, Java, Python, R, HTML, CSS, JavaScript, LaTeX
Technologies: Linux, Linux internals, Docker, QEMU, LibVirt, Kubernetes, Argo, GitLab API, Apache YARN & HDFS, Apache Spark, Pandas, GRPC, Java RMI
Expertise: Profiling, Resource Management and Scheduling, Networking, DNS, Systems Programming, PKI, SSL/TLS, Operating Systems, Distributed Systems concepts and design.