ROJA ESWARAN

(607) 232-4714 | reswara1@binghamton.edu | https://www.linkedin.com/in/roja-eswaran
https://roja-eswaran.github.io | 717 Chappell Drive, APT F, Raleigh NC 27606

EDUCATION

Doctor of Philosophy in Computer Science — Aug' 2020 – June 2024

Binghamton University, Watson College of Engineering, USA.

Master of Science in Computer Science, GPA: **3.8/4.0** — Jan' 2019 – May 2020

Binghamton University, Watson College of Engineering, USA.

Courses: Operating System, Systems Programming in Rust, Computer Networks, Computer Architecture.

Bachelor of Science in Computer Science and Engineering. GPA: **8.4/10.0** — Aug' 2014 – May 2018

Anna University, MEPCO Schlenk Engineering College, India.

TECHNICAL SKILLS

Languages: C/C++; Python; Go

Technologies: KUBEVIRT; QEMU/KVM Virtualization; Containers; Live Migration; Firmware/Embedded Systems; ARM/x86;

PROFESSIONAL EXPERIENCE

Research & Development Engineer, Zededa Inc, San Jose, CA — Aug' 2023 – Present

- Collaborating with KUBEVIRT/EVE to support compute cluster in edge nodes.
- Collaborated with QEMU-KVM/EVE to resolve the over-subscription of memory resources while launching VMs.

Research Assistant, Operating Systems and Networks Lab, Binghamton, NY — Jan' 2020 – June 2024

- Analyzed the performance of TCP and RDMA aware live migration on a Mellanox connectx-3 pro network card.
- Ported KVM to support virtual machines in ARM Platforms (NVIDIA Jetson and Raspberry-Pi) and analyzed the sources of latency in virtual timer and inter-processor interrupts using kernel-level microbenchmarks.
- First Authored research article titled "*Sharing-aware Live migration of Virtual Machines"* accepted by **IEEE/ACM International Symposium on Cluster, Cloud, and Internet Computing – CCGRID'24.**
- First Authored doctoral symposium article titled "*Incorporating Memory Sharing-awareness in Multi-VM Live Migration"* accepted by **IEEE/ACM International Symposium on Cluster, Cloud, and Internet Computing – CCGRID'24.**
- First Authored research article titled "*Template-aware Live Migration of Virtual Machines"* accepted by **EdgeComm: Symposium in Edge Computing – SEC'23.**
- First Authored *under review* journal article titled "*Seamless VM Shift: Efficient Intra-host Live Migration"* in **IEEE Transactions on Parallel and Distributed Systems.**

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File System Intern, Teradata Corporation, San Diego, CA May 2023 – Aug' 2023

Implemented gdb/filer support for Object File System (OFS) Spool proprietary to Teradata Vantage Cloud.

***Research Intern*,** Industrial Technology Research Institute (ITRI), Taiwan July 2022 – Dec' 2022

- Added seamless, chained templating and migration features to VM templating mechanism.
- Optimized the bootup and migration memory usage of VM template and Kata containers by 94%.

***Research Intern*,** Argonne National Laboratory, Illinois Jan' 2021 – May 2021

Collaborated with Argonne National Laboratory and improved DGEMM parallelism using user-level threads.

OPEN-SOURCE CONTRIBUTIONS

- Reduced the memory usage of Idle KUBEVIRT/EVE from 1.3G to 350MB.
- Upgraded the Xen-tool version from 4.18.0 to 4.19.0 for EVE to take advantage of new QEMU features.
- *Multi-threaded memory-region-aware-copy* to reduce copy overhead by 92% in state-of-art *memcpy.*
- Kernel-level Timer and Inter-processor Interrupt tests to measure the physical and virtual interrupt latency.
- IOCTL interface to retrieve page frame number for virtual page number using /proc/pid/pagemap.
- Enhanced QEMU/KVM live migration measurement accuracy using UDP timestamps and tcpdump for improved precision.
- Proposal entitled *"Reducing Hypervisor Overhead in Virtual Interrupt Delivery on KVM/ARM"* has been approved for a research proficiency examination conducted by Binghamton University.