MUHAMMAD BILAL NAEEM

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EDUCATION

Purdue University   West Lafayette, IN
Master of Science in Computer Science; GPA: 3.78   *2024*
  - Relevant Courses: Operating Systems, Compilers, Software Engineering, Software Security, Algorithms

Lahore University of Management Sciences (LUMS)   Lahore, Pakistan
Bachelor of Science in Computer Science; GPA: 3.62 (Dean's Honor List)   *2021*
  - Relevant Courses: Data Structures, Deep Learning, Network-Centric Computing, Intro to AI

PROJECTS

HyperODF | *Kernel Programming, QEMU/KVM, Kubernetes, Docker, C, Rust*   August 2021 – Dec 2023
  - Dramatically reduced VM clone time by 98%, from 1.5s to 20ms, through an innovative fork mechanism for QEMU/KVM VMs, leveraging in-memory snapshots and CoW page table copying of VM page tables.
  - Enabled millisecond-scale startup of hardware-accelerated VM-based sandboxes in Kubernetes environments, significantly improving cloud computing efficiency.
  - Created extensive tests and scripts to automate the testing and debugging of the HyperODF kernel modification, ensuring robustness and reliability in serverless environments.

Recollect | *C, Python, Bash, AFLGo*   April 2022 – Nov 2023
  - Engineered a novel system to reproduce bug-inducing inputs from incomplete reports, boosting AFLGo's efficiency in producing failure inputs by 9-200x.
  - Tested and validated the system on real-world open source applications, successfully and swiftly reproducing the failure-inducing inputs in over 90% of the cases.

EXPERIENCE

Purdue Reliable and Secure Systems Lab   West Lafayette, IN
Research Software Engineer   *June 2021 – Dec 2023*
  - Led the HyperODF project, pioneering advancements in virtualization and serverless computing with rigorous testing and debugging protocols.
  - Spearheaded communication and collaboration between the team and the open-source community
  - Contributed to the development and upstream integration of the On-Demand Forking feature, which was later adopted into the mainstream Linux Kernel.
  - Maintained extensive documentation for multiple projects, ensuring seamless onboarding of new team members.

LUMS Internet Security and Privacy Lab   Lahore, Pakistan
Research Software Engineer   *Aug 2019 – June 2021*
  - Devised a framework for automated playthrough and security testing of Android ARM-based mobile applications. This cybersecurity solution was used to test the privacy and security anomalies in over 100 applications.
  - Maintained embedded systems for the lab, helped members use Bluetooth and Wi-Fi modules for their projects.
  - Contributed to an automated benchmarking system for software debloating tools, streamlining software security.

Softronix   Lahore, Pakistan
Software Engineer   *Aug 2019 – June 2021*
  - Developed server-side APIs and Windows services for a Enterprise Sales Application in C#/.NET, used by over 150,000 people. Redesigned backend AWS architecture resulting in 25% decrease in system load.
  - Spearheaded the integration of newly built APIs with company's legacy SQL server. Integrated new features into the QT bsaed legacy app

TECHNICAL SKILLS

Languages: C#, Node.js, Express.js, React.js, Javascript(ES6+), SQL, C, C++, Python, Rust, Go
Frameworks/Tools: .NET, QT, MongoDB, Kubernetes, OpenFAAS, Docker, Helm, LLVM, Git, Kafka, eBPF, Glibc, Gtk
Systems: Linux, Unix, QEMU/KVM, I/O, VT-x, Kata Containers, CRI-O, AFL, AFLGo, Backend Programming, Performance Tuning