TWINKLE JAIN

Boston, MA ◇ 857.707.8421 ◇ jain.t@northeastern.edu ◇ linkedin.com/in/jaintwinkle ◇ www.jaintwinkle.com

EDUCATION

Northeastern University — Boston, MA
Ph.D. in Computer Science, GPA: 3.7/4.0 — 2017 – Present
Thesis Advisor: Prof. Gene Cooperman
Thesis Title: Application-transparent strategies to optimize limited resources in HPC and Big Data

Jai Narain Vyas University — Jodhpur, India
Master of Computer Applications, First Class with Distinction, equivalent GPA: 3.9/4.0 — 2012 – 2015

PATENT

Software Checkpoint-Restoration between distinctly compiled executables — (Granted in August 2022)
Twinkle Jain, Vipul Kulshrestha, Kenneth W. Crouch (US11429379B2) — Mentor Graphics

RESEARCH EXPERIENCE

Northeastern University — Boston, MA
Graduate Research Assistant — 2017 – Present
- **Projects**: Fix single point of failure of the ROS master, CRAC: a split-process-based architecture to checkpoint CUDA applications, CRAC-M: a flexible split-process design to support multiple lower halves (CUDA and MPI).

MemVerge, Inc. — San Francisco, CA
Summer Engineer Intern (Remote) — 2022
- Troubleshot memory corruption-related issues in MANA to checkpoint-restart at least three scientific HPC applications contributing around 25% of the total machine hours at NERSC Supercomputing sites.

IBM TJ Watson Research Center — Yorktown Heights, NY
Summer Research Intern (Remote) — 2021
- Analyzed the existing resiliency support in Ray, a distributed execution framework; demonstrated a 5% improvement in execution time and averted crashes caused by memory overflow via configuration tuning in Ray.

Inria — Nantes, France
Summer Research Visitor — 2019 & 2020
- Evaluated and improved speculative execution's implementation (to detect and handle stragglers) in Hadoop and Spark.

Mentor Graphics — Waltham, MA
Summer System Engineer Intern — 2018
- Developed a C/R plugin to restore an optimized executable as a debug build; reduced debugging time by 90%.

Stratus Technologies — Maynard, MA
Summer Platform Engineer Intern — 2017
- Assessed performance of COarse-grained LOck-stepping (COLO) technique on QEMU for fault-tolerance in servers.

SELECTED PUBLICATIONS

- "Towards an effective Speculative Execution in Spark" in VLDB 2023 (under review).
- "On the (In)Accuracy of Stragglers Detection in Hadoop" in FGCS 2023 (under review).
- "Stragglers' Detection in Big Data Analytic Systems: The Impact of Heartbeat Arrival" in CCGrid 2022.
- "CRAC: checkpoint-restart architecture for CUDA with streams and UVM" in SC 2020.
- "DMTCP: Fixing the single point of failure of the ROS master" in ROSCon 2017.

SELECTED ACADEMIC PROJECTS

Northeastern University

Compiler for a small Programming Language — 2018
- Wrote a standard compiler in SML-NJ language for Andrew Appel's Tiger programming language in a team of two.

Decrease Down-time in Live Process Migration — 2017
- Decreased downtime by 80% in process migration from one host to another by prioritizing memory-pages send order.

Jai Narain Vyas University

Maze Traversing Robot — 2015
- Built a wireless, camera-driven robot to find a path in a maze; Won Pixelate award in Asia's Largest Technical Festival.

TECHNICAL KNOWLEDGE

Languages and APIs: C/C++ (CUDA/MPI/POSIX), Python (numpy/matplotlib/pandas).
Distributed Frameworks: SLURM, Hadoop, Spark, Yarn, HDFS, Kubernetes, OpenShift.