

Shaurya Patel

CONTACT INFORMATION

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RESEARCH INTERESTS

Systems performance, Programming languages, Operating systems.

EDUCATION

University of Massachusetts
Masters of Science in Computer Science

Amherst, MA
Sep 2019 - May 2021

Nirma Institute of Technology
Bachelor of Science in Computer Science and Engineering

Ahmedabad, India
Aug 2013 - May 2017

RESEARCH EXPERIENCE

Compressed neurons: Compression based memory management
CS 692 - Systems for Machine Learning

UMass Amherst
Sep 2020 - Dec 2020

- Current memory management techniques for machine learning workloads include swapping and recomputating memory. Created a policy that can perform compression as an alternative.
- Benchmarked multiple compression libraries - nvcomp and zfp and are using superneurons as the baseline.
- Preliminary results show compression is atleast 2x faster than swapping.

Automatic Thread Scheduler
Advisor - Emery Berger

PLASMA, UMass Amherst
Aug 2020 - ongoing

- Proved with benchmarks the effect of scheduling on thread co-degradations.
- Created a scheduler that automatically learns the groups of threads to schedule based on assigned rewards.
- The scheduler has 10% higher throughput as compared to the CFS by setting affinity of threads.

sThreads: Thread scheduling for reducing tail latency
Advisor - Emery Berger

PLASMA, UMass Amherst
Jan 2020 - May 2020

- Created a benchmarking suite, benchmark execution framework and pre-emptive user space threading library.
- In a non-preemptive FCFS model a long running process will block shorter processes, raising tail latency.
- Memory intensive threads have a significant impact (20-30%) on the tail latency.

PROJECTS

Pygmy: A distributed online bookstore
CS 677 - Distributed Systems

UMass Amherst
Feb 2020 - May 2020

- Implemented replication along with client and server side caches for better performance.
- Created a fault tolerance load balancer using a heartbeat and automatic recovery for a failed service. Additionally the load balancer also supported automatic registration of new services.
- Implemented Raft based consensus protocol.

SnakeProf: A CPU and memory profiler for python
CS 630 - Systems

UMass Amherst
Oct 2019 - Nov 2019

- Developed a profiler that tracks wall-clock time and memory consumed on a function level in a python program.
- Used the concept of statistical profiling for minimum overhead during memory profiling.

Self Compacting memory allocator

CS 630 - Systems

UMass Amherst

Sep 2019 - Oct 2019

- Created a memory allocator for linux that performs automatic page compression.
- Automatic compression used exponential size classes and cold set. Permission for pages were managed using mmap and signal handlers.

PROFESSIONAL EXPERIENCE

Google

Software Developer Intern

Mountain view, USA

May 2020 - Aug 2020

- Updated a cache library for indexing location data being used by multiple teams to reduce latency by upto 6% across multiple projects.
- Added a feature to low-latency trades serving infrastructure at google to enable faster auctions of ads to be served by early rejection of 5% of total ads.

Morgan Stanley

Senior Associate

Mumbai, IN

Aug 2017 - Jul 2019

- Optimized the scalability distributed trading platform. Used containerization, machine learning and improved load balancing. Successfully increased throughput by 300%.
- Developed a distributed platform to calculate the fees for a given trade being processed using Gemfire. This increased efficiency of business processes by 200%.

Morgan Stanley

Intern

Mumbai, IN

Jan 2017 - Jul 2017

- Created TradeSpy, a distributed framework to debug trades being processed across a distributed environment.
- Visually represented data on a frontend and provided replay functionality.

AWARDS AND GRANTS

- OSDI and PLMW Student Grant, 2020
- Morgan Stanley Global Tech Excellence award, 2018.
- Morgan Stanley Outstanding delivery award, 2018.
- Morgan Stanley Best Project award, 2018.
- Regional mathematical Olympiad scholarship (3rd in city), 2009.
- Outstanding Student of the year award, 2007.

SKILLS AND TOOLS

- **Languages** : C++, C, Java, Python, SQL, L^AT_EX
- **Libraries and Frameworks** : Spring, CoreNLP, PyTorch, Scikit-learn, sqlite
- **Applications and Tools** : Agile, Devops , Docker, Jenkins , SQL, Gemfire, Silverking
- **Operating Systems** : Linux, Windows

VOLUNTARY WORK

- Worked as a student volunteer at SPLASH 2020.
- At Numeracy Hope, I took part in organizing mathematics teaching events and workshops for underprivileged kids in Ahmedabad.
- Volunteered in a paper collection and donation drive to raise awareness and funds about mental health.

LEADERSHIP EXPERIENCE

- **President of CSI, Nirma** - Responsible for leading a team of over 60 students in managing the club.
- **Core planning team, NUTech** - Planned a technical symposium for over 5000 students.