

RAJATH SHASHIDHARA

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EDUCATION

The University of Texas at Austin

Aug 2019 - Present

M.S. in Computer Science

GPA: -/4.0

Courses: Advanced Operating Systems, Datacenters, Virtualization

Birla Institute of Technology & Science (BITS), Pilani, India

Aug 2012 - June 2017

M.Sc. (Hons.) in Physics

GPA: 9.01/10

B.E. (Hons.) in Computer Science

Distinction Class

Courses: Parallel Computing, Operating Systems, Computer Networks, Data Mining, Information Retrieval

Adjudged **Best Student of Batch 2017** by Department of Physics for outstanding academic and research track record

EXPERIENCE

Samsung Research, Bangalore, India

July 2017 - Aug 2019

Senior Software Engineer (Research), Communication R&D Division

- Developed the fast data-plane radio access network stack (PDCP, RLC, MAC) for the world's first Pre-5G mobile user equipment. Technical support for the 5G demo at *PyeongChang Winter Olympics* (Korea, 2018)
- Research on *parallelization, memory management & flow control* to improve throughput and reduce memory footprint of datapath of 5G NR Distributed Unit (commercialized in USA & Korea) on native & NFV platforms
- Developed *Reinforcement Learning based Radio-Resource Scheduling* - multi-objective optimization in stochastic input-driven environments using Deep Q-Networks (DQN) & adapted policy iteration
- Presented with *Samsung Technical Excellence Award* for no critical S/W bugs in bare-metal real-time code

Symantec, Bangalore, India

Jan 2017 - June 2017

Software Engineering Intern, Website Security Development Team

- Designed a proof-of-concept microservices based cloud-ready web application to automate the purchase, delivery & installation of SSL certificates for webservices hosted on Amazon AWS

Microsoft, Hyderabad, India

May 2016 - July 2016

Software Engineering Intern

- Integrated Azure AD cloud authentication/authorization service into ASP.NET Core based web applications

Google Summer of Code

June 2013 - Sept 2013

Open-source Software Development Intern, Apache Software Foundation (OpenOffice)

- Developed an in-app document version control toolbar which connects to cloud content repository

RESEARCH

Studying Quantum Chaos in Aubry-André electron systems

Aug 2015 - Dec 2016

Advisor: Prof. Tapomoy Guha Sarkar, BITS Pilani

[\[Code\]](#) [\[Paper\]](#) [\[Thesis\]](#)

- Studied phase transitions in Hofstadter's butterfly under time-varying magnetic field and the relationship between *topological invariants and Hall conductivity*
- Simulated and computationally evaluated solutions to Schrodinger's equation for special quantum systems using perturbation methods and computational physics algorithms

Distributed Combinatorial Optimization on a Cluster

Mar 2016 - May 2016

Advisor: Prof. Sundar Balasubramaniam, BITS Pilani

[\[Code\]](#) [\[Design\]](#)

- Designed a distributed algorithm to efficiently perform *Branch & Bound search* on a commodity cluster
- Developed a load balancing technique based on *peer-to-peer diffusion* between nodes on toroid communication topology and *leftist-heap based work-stealing queues* between threads

Gravitational lensing in Elliptical Galaxies

May 2015 - July 2015

Advisor: Prof. Ko Chung-Ming, National Central University, Taiwan

[\[Code\]](#) [\[Report\]](#)

- Analytically derived the gravitational lensing equation for elliptical galaxies. Developed a *distributed recursive sub-gridding* algorithm to find the solution on a cluster and simulate the lensing

Satellite Image Stitching using Feature Recognition

May 2014 - July 2014

Bhaskaracharya Institute of Space Applications & Geoinformatics, Gandhinagar, India

[\[Code\]](#) [\[Report\]](#) [\[Slides\]](#)

- Surveyed existing literature on algorithms to *stitch large satellite images* into a mosaic. Evaluated performance of OpenCV implementations of SIFT & SURF algorithms on large datasets of satellite images

PROJECTS

Fast Semantic matching of strings generated by Context Free Grammar

Jan 2016 – May 2016

Advisor: Prof. Sundar Balasubramaniam

[\[Code\]](#) [\[Design\]](#)

- Designed a language for domain experts to express *semantic equivalence based on parse tree* structure.
- Developed a *hash function* to hash parse trees based for fast matching. Experimented on XML DBs

Persistent storage with C++ STL abstraction

Oct 2015 – Mar 2016

- Implemented *templated out-of-core (secondary storage) data structures* (B+ Trees, Vectors) with STL interface. User-space applications simply need to relink with library for persistent structures [\[Code\]](#)
- Customized *buffer caches* bypassing the kernel, *async I/O* for high efficiency
- Built a proof-of-concept TF-IDF based Search Engine using this library that scales beyond primary memory limits (> 100GB) [\[Code\]](#)

IoT enabled Laboratory Environment: Project SmartLAB

Aug 2012 – Dec 2013

- Proactive lab monitoring and activity tracking using *sensor networks, speech and gesture recognition* [\[Code\]](#)
- Awarded *Prof. I J Nagrath Student Project Fund* by Dept. of Electrical Engineering, BITS Pilani [\[Link\]](#)

PUBLICATIONS

Phase transition in an Aubry-André system with a rapidly oscillating magnetic field

[\[Link\]](#)

Tridev Mishra, [Rajath Shashidhara](#), Tapomoy Guha Sarkar, and Jayendra N. Bandyopadhyay

Phys. Rev. A 94, 053612 – Published 14 November 2016

HONORS & ACHIEVEMENTS

- **Best Outgoing Student of Batch 2017 Award** – adjudged by Department of Physics, BITS Pilani for outstanding academic and research track record
- **Prof. I J Nagrath Student Project Fund** for Project SmartLAB – awarded by BITSAA and adjudged by Department of Electrical and Electronics Engineering, BITS Pilani
- **BITS Pilani MCN Scholarship Award** – 80% tuition fee waiver for all semesters for consistent academic performance (top 5% in a batch of 800 students)
- **Samsung Professional Software Competency Certification** – held by < 10% employees globally
- **Samsung Annual Excellence Awards** – Outstanding Project of the Year 2018-19
- **Samsung Citizen Awards** – organization-wide award for technological excellence and quality of code

SKILLS

- **Languages:** C, C++, Java, Python (+numpy/scipy/matplotlib/PyTorch), Julia, LaTeX, JavaScript
- **Frameworks:** Linux, MPI, OpenMP, Pthreads, ODP, DPDK, ns-3, NodeJS, AWS, Azure
- **Tools:** git, gdb, make, valgrind, strace, qemu, kvm