

# SHALEEN GARG

Fourth Year Undergraduate

Computer Science and Engineering

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Hyderabad

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## EDUCATION

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Year	Degree	Institute
2019 (Expected)	CS Dual Degree	IIIT, Hyderabad
2014	AISSE, XII (CBSE)	FAIPS (DPS), Kuwait
2012	CISCE, X (ICSE)	The Aryan School, Dehradun

## PUBLICATIONS

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### **GPUScheduler : User Level Preemptive Scheduling for NVIDIA GPUs**

*Shaleen Garg, Kishore Kothapalli, Suresh Purini*

24th IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC-SRS10), Jaipur, India, December 18-21, 2017.

## RESEARCH PROJECT

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### **Preemptive Scheduling on NVIDIA GPUs**

*September'16 - Ongoing*

*Research Project: Dr.Kishore Kothapalli(Associate Prof, IIIT-H) & Dr.Suresh Purini(Assistant Prof, IIIT-H)*

- Developed a proof-of-concept scheduler using C and CUDA API which simulates preemptive scheduling and simulates time slicing for general purpose CUDA programs on NVIDIA GPUs.
- Used concepts gained in the above scheduler to provide a generic software-level preemptive scheduler for general purpose single-GPU applications.
- Trying to find and implement an approach for load balancing in multi-GPU domain involving the above developments.

## MAJOR PROJECTS

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### **Performance Engineering of Wireless IoT Sensors**

*November'16 - December'16*

*Course Project: Dr.Anil Gurijala (Founder CEO of Ashira Labs)*

- Designed a low-cost Wireless IoT Boilerplate hardware platform using readily available 8-Bit micro-controller (arduino micro) and other hardware modules
- The hardware is capable of housing 5-10 sensors (depending on the pins available on the arduino model)
- Tested the designed hardware platform to maximize both data transmission frequency and up-time (of the hardware), when connected to a finite remote power source like batteries
- Was successful in keeping the cost of the whole system as low as \$22.

### **Distributed Grep (Team-Mate Mr.Vinaya Khandelwal)**

*October'16 - November'16*

*Course Project: Dr.Vivekananda Vellanki(Co-Founder - Stealth Mode Start Company)*

- Implemented Hardtop Distributed File Systems in Java. Took care of underlying failures associated with this systems.
- Implemented generic Map-Reduce program over the HDFS and tested Distributed Grep on it.

### **Bflat Compiler**

*August'17 - November'17*

*Course Project: Dr.Suresh Purini(Assistant Prof, IIIT-H)*

- Implemented interpreter for Bflat(self-defined) language in C++.
- Implemented front-end compiler for LLVM Intermediate Representation generation.
- Used Flex(for tokens) and Bison(for grammar).

### **Distributed Graph Algorithms**

*May'16 - July'16*

*Summer Project: Dr.Govindarajulu R(Emeritus Prof, IIIT-H)*

- Implemented "Asynchronous concurrent-initiator depth first search spanning tree" and "Synchronous Breadth First Spanning Tree" in Erlang
- Tested the above algorithms on 5 nodes with graphs of size as large as 1 million vertices.

## SHORT TERM PROJECTS

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### **Ultimate Tic-Tac-Toe Bot**

*February'16*

*Course Project: Dr.Praveen Paruchuri (Associate Prof, IIIT-H), Artificial Intelligence*

- A python bot to play 9x9 ultimate tic-tac-toe. The bot uses 5 ply deep Alpha-Beta pruning to evaluate the next move based on self developed heuristics to win.

### DonkeyKong

September'15

Course Project: Dr.Raghu Reddy(Associate Prof, IIIT-H), Structured Systems Analysis and Design (SSAD)

- An ASCII implementation of the classical Donkey Kong game
- It showcases and rigorously uses all the concepts of Object Oriented Programming in python

### C-Shell

October'15

Course Project: Dr.Suresh Purini(Assistant Prof, IIIT-H), Operating Systems

- A C implementation of the shell using commands like execvp, fork, signal et cetera
- The shell has capabilities like piping, redirection and multiple commands

### Phone Wars (Team-Mates Mr.Punyaslok Pattnaik and Mr.Aagam Shah)

April'16

Course Project: Dr.PJ Narayanan(Professor & Director, IIIT-H), Graphics

- Produced an animated movie to showcase all the different concepts acquired in the course including camera positions, lighting et cetera.

### Online Carrom Game

March'16

Course Project: Dr.PJ Narayanan(Professor & Director, IIIT-H), Graphics

- Made an online carrom game using three.js and WebGL implementing collisions and different camera angles.

### 2D Maze Game

March'16

Course Project: Dr.PJ Narayanan(Professor & Director, IIIT-H), Graphics

- A 3D computer game programmed using OpenGL C++ API. The game uses a self-developed physics engine.

### NetZero Energy House for Hyderabad

April'16

Course Project: Dr. K.S. Rajan(Associate Prof, IIIT-H), Engineering Systems

- Served as a subgroup leader in a 5 member sub-team to design the Envelope of the system
- Worked with a 25 member team to propose a fully functional NetZero Energy residential house for Hyderabad, India

### P2P File-share

March'16

Course Project: Dr. Ganesh Iyer(Visiting Faculty, IIIT-H), Computer Networks

- File transfer between two clients with TCP and UDP sockets in python.
- Supports file upload/download with MD5sum checks and indexed searching.
- It periodically checks for any changes made to the shared folders

### Image Compression

March'16

Course Project: Dr.Vineet Gandhi(Senior Research Scientist, IIIT-H), Digital Signal Analysis

- Implemented image compression using discrete cosine transform and quantization on Matlab

## RELEVANT COURSES (\* PURSUING IN SPRING'18)

Data Structures and Algorithms	Distributed Systems	Principles Of Programming-
Operating Systems	Statistical Methods in AI	-Languages
Formal Methods	Systems and Network Security	Advanced Computer Networks
Digital Signal Analysis	Parallel and Scientific Computing	Database Systems*
Complexity and Advanced Algorithms	Compilers	

## COMPUTER SKILLS

**Languages:** C, C++, CUDA, Java

**Scripting Languages:** Python, Bash

**Other Tools/Languages:** L<sup>A</sup>T<sub>E</sub>X, Matlab

**Platforms:** Linux, Windows

**Hardware:** Arduino, ESP8266

## POSITIONS, COMMUNITY SERVICE AND CO-CURRICULAR ACTIVITIES

- Teaching Assistant for Distributed Systems course, Spring 2018, IIIT
- Teaching Assistant for Distributed Systems course, Monsoon 2017, IIIT
- Server Administrator at Center for Security, Theory and Algorithmic Research (CSTAR), IIIT
- Giving weekly chemistry lessons to the local underprivileged children as a **volunteer** in Ashakiran at IIIT
- Runners-Up in Mens Doubles **Table-Tennis** tournament in the annual sports meet 2016, IIIT
- Second Runners-Up in Mens Singles **Table-Tennis** tournament in the annual sports meet 2016, IIIT
- Second Runners-Up in under-18 Mens Singles **Table-Tennis** in the annual sports meet at St. George's College, Mussoorie