

Shubham Sharma

Final Year Student

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Educational Qualifications

Year	Degree/Certificate	Institute	CPI/%
2019(Expected)	Dual-Degree(B.Tech-M.Tech)	Indian Institute of Technology, Kanpur	8.9/10*
2014	Higher Secondary Education	Shivaji Science College, Nagpur	90.15%
2012	Secondary Education	D.A.V Public School, Akola	99.64%

* current

Achievements

- Received **Academic Excellence Award (IIT Kanpur)** for distinctive performance in the academic term 2015-16
- Selected for fellowship in **Kishore Vaigyanik Protsahan Yojana (KVPY)**(SX Stream)
- Participated in various events of **Regional DNA Fest** conducted by **Bharti Vidyapeeth University(BVIEER), Pune**
- Awarded **Second Best Sectional Award** for building an Effective Irrigation System model in the course TA201 IIT Kanpur
- Secured 3rd position in **FPGA Design Challenge**, at Techkriti 2016, annual Intercollegiate Technical Festival of IIT Kanpur

Internships

- Nutanix Software India Pvt Ltd, Bangalore**

MTS Intern

May'17-July'17

- Studied the architecture of Nutanix DRaaS(Disaster Recovery as a Service)
- Developed libraries and workflows in nutest (Nutanix automation framework) for various scenarios in DRaaS
- Automated, modified and executed test suites using nutest to cover the positive and negative code paths of DRaaS
- Tracked, identified and logged bugs using JIRA and worked closely with DR team to fix them

- Okul Education Solutions Pvt Ltd, New Delhi**

Stack Developer

May'16-July'16

- Maintained, developed and analyzed new features for Okul, an online application that aimed at giving on-line education for school level students using ASP.NET MVC(Model View Controller) Entity Framework
- Extensively involved in creating Views and Partial Views using Scaffolding Templates Custom Html Helpers and Razor View Engine on ASP.NET MVC Framework
- Used AJAX, JSON with jQuery for data request and response processing, Amazon Web Services to store and retrieve files and Google, Facebook OAuth2 services to build a Social Authentication Feature
- Developed and simulated the Item Response Theory

Publications

- Knowledge Compilation meets Uniform Sampling
Shubham Sharma, Rahul Gupta, Subhajit Roy, and Kuldeep S. Meel
Proceedings of International Conference on Logic for Programming Artificial Intelligence and Reasoning (LPAR), 2018
- Detecting Insider Attacks on Databases using Blockchains (Extended Abstract)
Shubham Sharma, Rahul Gupta, Shubham Sahai Srivastava and Sandeep K. Shukla
Proceedings of 2nd Advanced Workshop on Blockchain: Technology, Applications, Challenges, ISRDC IIT Bombay, 2017

Key Projects

- [Block Chain] Distributed Application to log user activity on OARS**

Mentored by **Prof. Sandeep Shukla**

Aug'17-Nov'17

- Aimed at logging activities of students, professors and admins on Online Academic Registration System(OARS)
- Used Public Key Infrastructure(PKI) on a permissioned and distributed blockchain using Multichain
- Implemented Principal of Least Privileges on a central MySQL server and a permission server for blockchain stream

- [Computer Systems Security] Securing Zoobar Web Server**

Mentored by **Prof. Sandeep Shukla**

Jan'17-April'17

- Studied the architecture of the zoobar web server - a model of OKWS web server for building fast and secure web services
- Exploited security vulnerabilities using Control Hijacking techniques, Privilege Escalation techniques, Buffer Overflow attacks, browser-based attacks like SQL Injection, Cross Site Scripting, Cross Site Request Forgery and Cookie Thefts
- Improved applications security using Stack Canaries, Privilege Separation and Server-Side Sandboxing

- [Compilers] Compiler for Scala**

Mentored by **Prof. Amey Karkare**

Jan'17-April'17

- Programmed a Scala to NASM(an 80x86 and x86-64 assembler) compiler with support for basic data-types, conditional statements, looping statements, arrays, type checking, basic type inference, nested functions and recursion
- Implemented lexer, parser, register allocation algorithm, symbol table, optimization algorithm, advanced three address code, assembler and abstract syntax tree for various Scala language features
- Developed extra features like default parameter value of functions, classes and special data-structure(list) to store graphs

- **[DBMS] AuctionBase**
Mentored by Prof. Medha Atre *Jan'17-April'17*
 - Analyzed and parsed the large volume of data downloaded from eBay website and designed a good relational schema for it
 - Implemented triggers and various integrity constraints in order to maintain data integrity and consistency
 - Developed back-end to manage Auctionbase data using the SQLite database management library and user friendly front-end for real time auction
- **[Distributed Systems] HBase for Prutor**
Mentored by Prof. Satyadev Nandakumar *Aug'16-Nov'16*
 - Studied the architecture of HBase, its limitations and advantages in comparison with traditional MySQL database
 - Experimentally analyzed Select and Insert query on HBase and MySQL using multi-threading
 - Compared the performance of MySQL and HBase on different scenarios(queries per sec) and made conclusions accordingly
- **[Algorithms and Web Technologies] Automatic Room Allocation**
Mentored by Prof. Satyadev and Prof. Kurur *Aug'16-Nov'16*
 - Built an application to allocate best possible rooms to hostel students in their respective wings according to their preferences
 - Modified the Stable Marriage algorithm and Hungarian/Munkres algorithm and used their combination to find best matching pair of students for a particular room
- **[Operating Systems] NachOS**
Mentored by Prof. Mainak Chaudhari *Aug'16-Nov'16*
 - Implemented system calls pertaining to Fork, Exec, Join, Yield, Sleep and Exit for NachOS (a rudimentary OS)
 - Programmed different signal handling methods, process scheduling and page replacement algorithms and evaluated their relative performance
- **[Machine Learning] Wildlife Conservation Project**
Mentored by Prof. T.V Prabhakar *Dec'15-Jan'16*
 - This project aimed to identify areas vulnerable for tigers in a national park to minimize their killing by poachers
 - Generated data facilitating formation of clusters and incorporated attributes like terrain, month and time of killing
 - Built SVM (Support Vector Machine) trained over this data to get coefficients of hypothesis resulting in 80% accuracy
- **[Discrete Maths] Picks Theorem Analysis**
Mentored by Prof. Rajat Mittal *Sept'15-Nov'15*
 - Studied the proof of Picks theorem using Induction and Eulers formula
 - Studied the relation between Picks theorem and Fareys sequence
 - Extended the theorem to calculate area of polygons having holes
- **[Machine Learning] Gesture Recognition Using IMU Sensor**
Mentored by Electronics Club IIT Kanpur *May'15-Jun'15*
 - Collected, filtered and processed the data of Yaw, Pitch and Roll from an IMU sensor using Matlab
 - Studied Neural Network architectures and trained the network to recognize 10 gestures that achieved 90% accuracy
 - Built an interface using java.awt.project library in Matlab to operate different keyboard keys and mouse cursor using gestures

Technical Skills

- **Programming Languages :** C/C++, Python, Haskell, C#, HTML, CSS, Javascript, Verilog, Php
- **Software and utilities :** Latex, Git, Matlab, Django, Visual-Studio, PyCharm, R-studio, SQL Server
- **Platforms :** Linux and Windows

Relevant Courses

- **Computer Science :** Data Structure and Algorithms I/II, Fundamentals of Computing, Computer Organisation, Computing Laboratory I/II, Operating Systems, Theory of Computation, System Security, DBMS, Compiler Design and Analysis, Computer Networks, Machine Learning Techniques
- **Mathematics :** Probability and Statistics, Linear Algebra, Abstract Algebra, Discrete Mathematics, Introduction to Logic, Introduction to Calculus, Complex Variables, Numerical Methods

Positions of Responsibility

- **Student Guide, Institute Counselling Service** *Jul'15-Apr'16*
 - Guided group of 8 freshmen in their induction into the institute, gave them academic as well as moral support
- **Secretary, Electronics Club** *Jul'15-Apr'16*
 - Worked to initiate lectures and various activities in club
- **Tiger Ambassador of Akola City:** *May'10-May'11*
 - Managed various natural activities in Akola city under the guidance of Satpuda Foundation and Kids for Tiger