Srijan R. Shetty

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Interests

Programming Languages, Networks and Systems, Security, Web-Development, Natural Language Processing

Education

Current	B. Tech in Computer Science and Engineering **Indian Institute of Technology**, Kanpur	9.5/10.0
July 2011	12^{th} Board, CBSE Board **The Emerald Heights International School**, Indore	91.4%
July 2011	10^{th} Board, ICSE Board **The Laurels School International**, Indore	95.4%

Scholarships and Conferences

Jan 2011	Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship
Dec 2009	CSIR Programme on Youth for Leadership in Science held at Advanced Materials Research Institute, Bhopal

Scholastic Achievements

2011-2014	Received an **A* grade**, for exceptional performance in **Computer, Internet and Network Security**; **Computer Networks**; **Computer Organization**; **Logic for Computer Science**; **Fundamentals of Computing**; **Introduction to Philosophy**
2012-2013	**Academic Excellence Award**, IIT Kanpur.
2011-2012	**Academic Excellence Award**, IIT Kanpur.
2012-2013	**Academic Mentor**, **Fundamentals of Computer Science (ESC101)**. Tutored a batch of four students in ESC101 – a core course on basic concepts of programming – the instructor-in-charge was **Professor Sumit Ganguly**
Jan 2010	Qualified **Regional Mathematics Olympiad** (RMO)
May 2011	Secured All India rank **1937** in Joint Entrance Exam (JEE)
Sep 2010	**AIR 17** in **Technothlon** (Techniche) conducted by Indian Institute of Technology Guwahati.
Jun 2010	Earned **Top Scorer in English** by **Laurels School International** in ICSE 2009.
Dec 2009	Awarded **Overall Best Student** for displaying all round excellence.
Dec 2008	Secured All India Rank 297 in FIITJEE Talent Reward Examination.
Dec 2005	Awarded **Overall Best Student** for displaying all round excellence.
2005, 2009	Awarded **Overall Best Student** for displaying all round excellence.
2000-2009	Recipient of **Scholastic Excellence** awards for exemplary academic performance throughout 2^{nd} to 12^{th} grade.
–	Achieved AIR **140 in 8th, 154 in 9th and 429 in 11th** National Cyber Olympiad.
–	Achieved AIR **57 in 9th** National Science Olympiad.

Skill Set

Languages	**JavaScript** (Expert), **Python** (Proficient), **C++** (Proficient), **C#** (Efficient), **C** (Proficient)
Web Dev	**HTML5**, **CSS**, **SQL and NoSQL**, **AngularJS**, **Nodejs**
Tools	**Git** (Expert), **Shell Scripting** (Proficient), **Prezi** (Proficient), **Vim** (Expert), **LaTeX** (Proficient)

Work Experience

Research Intern — May-July 2014

Microsoft Research India, Bangalore

- CScale provides a declarative distributed systems programming model using LINQ. A programmer with no distributed system experience can specify the computation intent in LINQ and CScale handles scaling the system and fault tolerance.
- Analysed the implementations of different distributed systems and databases architectures like **Google MapReduce**, **Google FileSystem**, **Google Mill-Wheel Yahoo! PNUTS**, **Amazon DynamoDB**, **Apache Kafka**, **Apache Spark**, **Apache Hadoop**, **Apache Storm**, **Microsoft Dryad**, and **Microsoft DryadLINQ** to understand the design decisions involved.
- Designed and implemented using **TPL Dataflow** and **Asynchronous Tasks**, a dataflow pipeline for processing partially ordered messages in order to create a new totally ordered sequence.
- Used **TPL Dataflow** and **Lightweight Tasks** to implement concurrent pipeline processing of messages in CScale to preserve processing order of partially ordered messages.
- Performed **performance testing** of the concurrency optimizations in real world scenarios leading to a gain in processing time.
- Performed **failure testing** of the existing infrastructure and debugged detrimental replication errors in the existing infrastructure.

Software Development Intern — May-July 2013

Aurus Networks', Bangalore

- Ported the legacy flash based web player in **CourseHub** — Aurus Networks' MOOC offering — to a technology agnostic **HTML5/JavaScript** web player leading to a uniform cross-platform viewing experience.
- Developed a **XMPP** based **real-time chat service** using Jabber framework, for conversations during live lectures.
- Engineered an extensible Jabber framework for real-time communications between different services.

Course Projects

Multi Factor Authentication in OpenVPN — Monsoon 2014-2015

Mozilla Winter of Security, Guillaume Destuynder and Professor Dheeraj Sanghi [Project Wiki]

- One of the eleven projects to be selected as a part of Mozilla's Winter of Security Initiative 2014.
- The objective of the project is to implement true arbitrary multi-factor authentication support in OpenVPN; and to implement session-support for the additional factors.
- https://wiki.mozilla.org/Security/Mentorships/MWoS/2014/OpenVPN_MFA

JavaScript to MIPS Compiler — Winter 2013-2014

Compilers, Professor Subhajit Roy [Repository]

- Implemented an end-to-end compiler for an ECMAScript 5.1 based language to compile to MIPS architecture, in Python.
- Abstracted the compiler into modules corresponding to lexing, parsing, three address code generation and machine code generation to provide a flexible compiler architecture.
- Designed a standard library to handle printing of different data types.
- Circumvented runtime support by implementing static types and type annotations.
- Implemented first class functions, anonymous functions, nested function scopes and recursion.
- Implemented an end-to-end ECMAScript 5.1 compiler for the MIPS architecture with support for first class functions, anonymous functions, static types, type annotations, recursion and nested functions.
- https://github.com/srijanshetty/javascript-compiler

Hindi author attribution — Winter 2013-2014

Artificial Intelligence, Professor Amitabha Mukherjee [Repository]

- Presented a poster on Opinion Word Expansion and Target Extraction through Double Propogation, Guang Qin, Bing Liu, Jiajun Bu, Chun Chen that was nominated as the best poster by all students.
- Selected as one of the top seven projects at the end of the term.
- Generated a Hindi literature corpus consisting of works by Rabindranath Tagore, Vibhuti Narayan, Premchand, Sarat Chandra Chattopadhyay and Dhamarvir Bharati.
- Used Unigrams, Bigrams and Trigrams as features for clustering.
- Clustered a sample set of multiple Hindi authors using K-means unsupervised clustering to achieve F-scores in the range of 90-97% for each author.
- Classified each author using Support Vector Machine Classification using Radial Basis Kernel function and achieved an F-score of 90–95% for each author.
- Performed Multiple Discriminant Analysis on the data for a quantitative comparison with word collocations; there was no appreciable difference in the results with the F-scores increasing only marginally.
- https://github.com/srijanshetty/author-attribution

NachOS — Monsoon 2013-2014

Operating Systems, Professor Mainak Chaudhari

- Extended the standard system call library of NachOS and implemented system calls pertaining to Fork, Exec, Join, Yield, Sleep and Exit. https://github.com/srijanshetty/nachos-syscalls/
- Implemented process scheduling algorithms: UNIX Scheduling, First in First Out, Round Robin, Shortest Job First and Non-pre-emptive job scheduling to assess their relative performances. https://github.com/srijanshetty/nachos-scheduling
- Programmed page replacement algorithms: Random Page Allocation, First in First Out, Least Recently Used(LRU) and LRU Clock to evaluate relative performances under difference scenarios. https://github.com/srijanshetty/nachos-final/

P2P File Sharing and Streaming — Monsoon 2013-2014

Computer Networks, Professor Dheeraj Sanghi [Repository]

- Conceived a protocol for peer-to-peer file and media transfer.
- Implemented the designed protocol to create a CLI agent for the same.
- Leveraged Node.js to handle high number of concurrent connections.
- Conceived and implemented a peer-to-peer protocol for file and media transfer in Node.js to share data over the institute LAN.
- https://github.com/srijanshetty/nodesock

IP Spoofing — Monsoon 2013-2014

Computer Networks, Professor Dheeraj Sanghi

- Generated raw Internet Protocol (IP) packets with spoofed IP address.
- Exploited spoofed packets to perform Smurfing, ARP Poisoning and SYN Flooding.
- Tested the implementation in a secure subnet.
- Generated raw IP packets with spoofed IP addresses to exploit test machines with ARP Poisoning, Smurfing and SYN Flooding.

Monsoon semester: July to November
Winter Semester: January to April

Prolog Shortest Paths and Erlang Traffic Server — Monsoon 2013-2014

Principles of Programming Languages, Professor Piyush Kurur

- Implemented shortest path algorithm in Prolog using Logic Programming on the Delhi Metro route.
- Implemented a simple traffic server in Erlang using message passing concurrency and tail call recursion.

8-bit General Purpose Computer on a FPGA — Winter 2012-2013

Computer Organization, Professor Subhajit Roy [Repository]

- Designed an Instruction Set Architecture (ISA) for a 8-bit General Purpose Computer with a load-store architecture.
- Programmed a **Xilinx Spartan 3 FPGA** in System Verilog to implement the ISA.
- Encoded a simple assembly language to compile to the machine code.
- Accomplished recursion, jumps, loops and conditionals.
- Designed and programmed a simple Instruction set Architecture (ISA) for a 8-bit General Purpose Computer with a load-store architecture on **Xilinx Spartan 3 FPGA** using System Verilog.
- Demonstrated recursion, looping and conditionals on the Computer by using a simple assembly language.
- https://github.com/srijanshetty/220_y11

Conference Dates Web Crawler — Winter 2012-2013

Computing Laboratory [Repository]

- Developed a python based web crawler to crawl paper submission deadlines for a given paper and conference name.
- Qualitatively tested the advantage of Depth First Search over Bread First Search for crawling.
- Utilized regular expressions, BeautifulSoup and urllib to perform crawling.
- Developed a python based web crawler to crawl paper submission deadlines for a given paper using BeautifulSoup and urllib. https://github.com/srijanshetty/crawler

Lawn Mower — Winter 2012-2013

Manufacturing Process II, Professor Sounak K. Choudhury

- Designed a model for a simple Lawn Mower in AutoCAD which could convert translatory force applied to it into rotatory motion of its blades.
- Prototyped the design over the course of six week using mechanical processes.
- Selected as one of the top 15 projects in over 60 completed projects.

Batmobile — Monsoon 2012-2013

Manufacturing Process I, Professor Kallol Mondal

- Designed a model for the Batmobile as seen in The Dark Knight Series, in AutoCAD.
- Prototyped the design over the course of six week using metallurgical processes.

No situation is unique and certain moral principles can be applied across all situation — Monsoon 2011-2012

Introduction to Philosophy, Professor Vineet Sahu

- Illustrated the existence of a fundamental similarity in all situations by a gross simplification.
- Justified the use certain moral principles across all situations by leveraging the above stated hypothesis.

Independent Projects

OARS — July 2014

- Scraped the institute academic records to create a database of all courses offered by the institute.
- Created an AngularJS based frontend search for the scraped data with a focus on ease of use and accessibility.
- Scraped the institute academic records to create a database of all courses offered by the institute to create an AngularJS based course search over the existing legacy course search.
- https://navya.github.io/oars
- [Website]

Get Your Personal Homepage (GYPH) — March 2014

- Eased the process of creating minimalistic websites for not-so-tech-savvy students.
- Provided a directly editable interface for editing websites using JavaScript and HTML5.
- Enabled users to use custom themes and download the created website for personal use.
- Eased the process of creating minimalistic websites for not-so-tech-savvy students by creating a WYSIWG website editor.
- http://gyph2.herokuapp.com/
- [Website]

ShuffleRun — August 2013

- Designed a web application to select a music track from a user's music library based on his current running speed.
- Pitched the idea at **Yahoo! HackU 2013**.
- Received an honourable mention in **Yahoo! HackU 2013** for the created hack.
- Pitched ShuffleRun – a music player which selects tracks on the basis of the user's running speed to receive and honourable mention at **Yahoo! HackU 2013**.
- https://github.com/srijanshetty/ShuffleRun
- [Repository]

Voicing, Archiving and Networking the Information (VANI), IIT Kanpur — Summer 2012

Professor Manindra Agarwal, Professor T. V. Prabhakar

- Conceptualized the idea of VANI - an extensible student community platform consisting of a Student Wiki, Forums, Community Search, Calendar and Lost and Found.
- Developed the Lost and Found module using **Drupal** for VANI.
- Conducted sessions on the extending VANI to create rich applications.
- Developed the Lost and Found module using **Drupal** and conducted sessions on the extending VANI to create rich applications.

GNU/Linux Exploration, Programming Club, IIT Kanpur — Summer 2012

- Explored various facets of **GNU/Linux** like the file system, process management, memory management, shell interface etc.
- Documented all salient points for use by the freshmen of the institute.
- https://docs.google.com/document/d/1ZHO9w36aoq3oaZBR4Um1AOmDfiTDAEgM6baQAu3icw4/edit?usp=sharing
- Explored and documented the various facets of **GNU/Linux** like the file system, process management, memory management, shell interface etc to serve as a reference for the Student Community.
- [Documentation]

Projects on Github

- **Dotfiles**: an opinionated work flow on Linux Systems. https://github.com/srijanshetty/dotfiles
- **Prezto**: a fork of the Prezto ZSH framework https://github.com/srijanshetty/prezto
- **oh-my-zsh**: a fork of the oh-my-zsh ZSH framework https://github.com/srijanshetty/oh-my-zsh
- **DS**: implementation of certain algorithms and data structures https://github.com/srijanshetty/DS
- **Custom**: handy configurations and shortcuts for ZSH https://github.com/srijanshetty/custom
- **Notes**: notes on computing and social sciences. https://github.com/srijanshetty/notes

Web Development

- **Udghosh '13**: The annual sports-fest of IIT Kanpur. http://udghosh.srijanshetty.in
- **Junoon '14**: Eastern Band Competition, Antaragni '14. http://junoon.srijanshetty.in
- **Hall 5**: Fifth Hall of Residence, IIT Kanpur. http://www.iitk.ac.in/hall5
- **ALI, Antaragni '14**: Antaragni Leadership Initiative. http://ali.srijanshetty.in

Social, Leadership and Artistic Skills

Active blogger at srijanshetty.quora.com

Hacker, Navya, FOSS Group IIT Kanpur

- Navya is the resident Free and Open Source Software Group of IIT Kanpur.
- Promoted the FOSS initiative in campus by organizing student lectures and meet-ups.
- Built student-centric applications like Course Search and Student Search, to circumvent their legacy institute counterparts.
- https://github.com/navya

Head, Major Events and Competitions, Antaragni '14 — 2014

- Orchestrated Roadtrip — the National Campaign of Antaragni '14, under which national prelims for Nukkad, Dance, Quiz and Synchronicity were held in Pune, Mumbai, Chennai, Bangalore, Chandigarh, Bhopal, Lucknow, Kolkata, and Kanpur.
- Negotiated with leading academies of Dance, Musicals, and Fine Arts to provide mentorships, and other non-monetary incentives to the outstanding cultural performers in Antaragni under the banner of **Dream On** campaign.
- Coordinated the conduction of fifty competitions and nine major events with a team comprising of over thousand volunteers.
- Oversaw the hospitality arrangements of the 1800 participants.
- Initiated and organized Mr. & Ms. Fresher's competition as an Antaragni Initiative for the freshmen.
- Introduced Choreo Nite to the arsenal of competitions held in Antaragni.
- Initiated and organized Mr. & Ms. Fresher's competition and introduced Chreo Night in Antaragni's arsenal of competitions.
- Promoted Road Safety as a part of the social campaign of Antaragni – Zara Sambhal Ke by conducting public polls and spreading general awareness about the same.
- Publicized Antaragni on social media platforms by contributing creative content.

Hospitality Coordinator, Antaragni '13 — 2013 – 2014

- Overhauled the methodology of inviting colleges all around the country by calling college societies over college cultural unions.
- Worked with a team of five fellow coordinators in planning the accommodation of 1500 participants.
- Chalked out the logistics of hospitality and accommodation of **1500 participants** with four other coordinators.
- Managed a team of 40 secretaries and 80 volunteers, over a span of 8 months and ensured a flawless conduction of the festival.
- Handled security arrangements during the four days of the Festival from 24^{th} to 27^{th} October.

Member, Gymkhana Review Committee (GRC) — 2013 – 2014

- The GRC, a standing committee of the Students' Senate of IIT Kanpur was mandated with suggesting changes to the existing structure of the Students' Gymkhana, IIT Kanpur.
- Chaired the meetings on **Extended Orientation of Incoming Freshmen**.
- Contributed actively as a member of academic, senate and activities sub-committees of the GRC.

Editor-in-chief, Vox Populi, the campus newsletter. — 2013 – 2014

Webmaster, Hall 5 2012 – 2013
Senator, Students' Senate, IITK Y11 batch. 2012 – 2013
Secretary, English Literary Society 2012 – 2013
Secretary, Hospitality Cell, Antaragni '12 2012 – 2013
Volunteer, Hospitality Cell, Antaragni '11 2011 – 2012
3^{rd} prize, Essay Writing Competition, Spectrum '11 2011 – 2012
Basic training in **Indian Classical Music**. (Prayag Sangeet Samiti Allahabad). 2010 – 2011
Qualified for the semi-finals of **Outlook SpeakOut Debate**. 2009
Class Prefect, Ninth Grade. 2007 – 2008
House Captain, Einstein House. 2005 – 2006
Class Prefect, Second Grade. 2000 – 2001

Volunteer Work

Member, Institute Anti Ragging Committee 2014 – 2015

- Appointed as a member of the Institute Anti Ragging Committee, a 10 member committee responsible for welfare of the newly admitted freshmen.
- Worked in tandem with the office of the Dean of Student Affairs, to organize sessions on easing the transition of freshmen to college life.
- Ensured institute norms regarding humane treatment of freshmen are properly conveyed to all senior batches and worked towards the enforcement of those norms.

Community Service, English Proficiency Programme 2013 – 2014

Professor Bhaskar Das Gupta

- A brainchild of **Professor Bhaskar Das Gupta**, English Proficiency Programme tries to impart a functional knowledge of English to students.
- Worked as a English tutor in the pilot programme to help under-privileged students from and around IIT Kanpur campus.
- Organized the second phase of the programme, aimed at school teachers by meetings principals from schools in and around IIT Kanpur.
- Worked as a English tutor in the pilot English Proficiency Programme to help under-privileged students obtain a functional knowlege of English; and helped in the conduction of second phase of the project aimed at school teachers in nearby schools.

Academic Mentor, Fundamentals of Computing 2012 – 2013

Professor Sumit Ganguly

- Tutored four students in Fundamentals of Computing, a beginner level course on C.
- Aided the instructor in understanding the difficulties faced by students by acting as a link student between the students and instructor.

Social Initiative, Antaragni '14 2014 – 2015

- Organized a blood donation camp for the residents of IIT Kanpur.
- Mobilized information about road safety through posters, infographics and questionnaires via Antaragni's nation wide social campaign **Zara Sambhal Ke**.
- Organized a Respect March on the 15^{th} of August in honour of the sacrifices made by our freedom fighters and to instil patriotism in the residents of IIT Kanpur.
- Organized a blood donation camp for the residents of IIT Kanpur to promote awarness about road accidents. Mobilized information about road safety through infographics and questionnaires via Antaragni's nation wide social campaign **Zara Sambhal Ke**.
- Organized a Respect March on the 15^{th} of August, to infuse a sense of patriotism on the occassion of Indian Independence day.

Course Work

Theory of Computation (CS340)	(CS201) Discreet Mathematics
Abstract Algebra (CS203A)	(CS202A) Logic for Computer Science
Data Structure and Algorithms (CS210)	(CS345) Design and Analysis of Algorithms
Operating Systems (CS330)	(CS335) Compilers
Computer Networks (CS425)	(CS628) Computer and Internet Security
Computer Organization (CS220)	(CS350) Principles of Programming Languages
Artificial Intelligence (CS365)	(CS251 & CS252) Computing Laboratory
Computational Methods in Engineering (ESO208A)	(CS300) Technical Communication
Linear Algebra (MTH102)	(MTH101) Multivariate Calculus
Microeconomics (ECO201)	(IME636) Introduction to Game Theory