Suyash Agrawal

Computer Science and Engineering
Indian Institute of Technology, Delhi

suyash1212@gmail.com
github.com/ozym4nd145
linkedin.com/in/suyash1012

Academic Details

Year	Degree	Institute	CGPA/Percentage
2015-2019 (Current)	B.Tech in Computer Science and Engineering	Indian Institute of Technology Delhi	9.898 **Institute Rank 1**
2015	Class XII, CBSE	Vishva Bharti Public School	96.4%
2013	Class X, CBSE	Christ Jyoti Senior Secondary School	10.00

Scholastic Achievements

- Secured **All India Rank 69** in Joint Entrance Exam Advanced - 2015 among 150 Thousand candidates.
- **Institute Rank 1**. Consistently maintaining institute rank in top 3 among 850 students during academic years 2015-2017. IIT Delhi granted scholarship for the same.
- Selected for **ACM-ICPC 2017 and 2018** Regional Round with a rank of 155 all over India.
- Runner up in **Microsoft's Code.Fun.Do** campus wide Hackathon in 2016, 2017 and 2018.
- Selected as **KVPY** Scholar in 'Kishore Vaigyanik Protsahan Yojana' by Indian Institute of Science given to top 1%.
- Became a National Talent Search Examination (**NTSE**) scholar for being in top 1000 at National level in 2013.

Major Projects

Automated Video Description Prof. Subhashis Banerjee, May-July 2017

- Built software for generating novel description of short video clips.
- Used transfer learning in encoder by employing state of art CNN (Inception V4) to encode individual video frames.
- Designed encoder decoder network architecture consisting of Multilayered LSTMs to achieve this translation.
- Experimented with Data Augmentation, Audio Features, Attention models, Loss metrics to improve performance.
- Explored its application in areas like video surveillance and in helping visually impaired.

Automated Image Captioning Prof. Subhashis Banerjee, Jan-April 2017

- Developed a software to automatically generate captions for images.
- Used an encoder decoder network similar to that in machine translation for generating captions.
- Used Inception V4 network to generate image embedding using transfer learning.
- Used Multilayered LSTM network to decode image embedding into natural language sentence.
- Achieved baseline performance of paper Show and Tell by Vinyals et al.

Pipelined MIPS Simulator with debugger and cache simulator Prof. Kolin Paul, Mar-April 2017

- Developed a pipelined MIPS simulator in C that supported animation of instructions being executed in different stages.
- Simulated all pipelined stages in parallel using threads (pthreads).
- Designed a trace based cache simulator and debugger for the processor with various configuration options.
- Used SVG to show current instruction in each stage and Javascript, CSS for styling.

Other Projects

Flashsubs Independent Project, Mar - April 2016

Created a software for management of media library (Movies/TV Series) which intelligently fetches subtitles and renames obfuscated media files. It uses file hash to identify media in online database and uses filename for identification as last resort. It automatically downloads metadata like IMDb rating, plot, actors list etc. The link to project is here.

Rendezvous CAP Portal Independent Project, June - July 2017

Designed and developed the entire backend of Campus representative portal in NodeJS. Used Amazon DynamoDB for database and designed ingenious table structure to minimize the number of tables required. Implemented token based authentication along with OAuth Login and designed RESTful APIs for the entire competitive portal.

Multicycle ARM Processor Prof. Anshul Kumar, Mar - April 2017

Developed a Multicycle ARM processor in VHDL on FPGA. Modelled memory as slave and used AHB Lite bus for connection. Implemented UART for memory and extended processor with 7 segment display and interrupt controller.

Prolog Interpreter Prof. Sanjiva Prasad, Mar - April 2017

Designed a prolog interpreter written in OCaml. It used OCaml-lex for token generation and OCaml-yacc for parsing. Backtracking and rule unification were used to implement the relational backbone of the interpreter.

Krivine and SECD Machine Prof. Sanjiva Prasad, April - May 2017

Implemented a compiler with krivine and secd machine in Ocaml. A Lex Scanner converted program to tokens which were converted to an Abstract Syntax Tree using Recursive Descent Parser. The AST was type checked and a low level code was generated, which was executed by the machines. Machines also supported features like scoping,recursion etc.

Relevant Courses

- **Computer Science:** *(*Courses currently pursuing)*
  Computer Vision*, Algorithm Design*, AI*, Networks*, Logic for CS*, Cryptography*, Programming Languages, Computer Architecture, Design Practices, Data Structures & Algorithms, Discrete Mathematics, Digital Logic
- **Mathematics and Electrical:** Signals & Systems, Prob. & Stochastic Processes, Calculus, Linear Algebra.
- **Online:** Deep Learning (Fast.ai), Intro to Machine Learning (Stanford, Coursera), Intro to CS (CS50, Harvard).

Technical Skills

- **Programming Languages:** C, C++, Python, Java, JavaScript, NodeJS, OCaml, VHDL, C#, Matlab.
- **Frameworks:** ExpressJS, Django, Web2Py, Bootstrap, JQuery, MongoDB, DynamoDB, Tensorflow

Extra Curricular Activities

- Co-founded **Development Club** in IIT Delhi to spread software development culture in college.
- Coordinator at **Coding Club**, responsible for organizing all competitive coding related events at IIT Delhi.
- Elected as **Microsoft Student Partner**, responsible for representing Microsoft at IIT Delhi.
- **Technical Activity Head** at Rendezvous 2017, responsible for all the technical back-end of the cultural festival.