HIMANSHU **MUNDHRA**

AE-312, MS Hall of Residence, IIT Kharagpur, West Bengal, India - 721 302 | **+91 91639 95974**
himanshumundhra98@gmail.com | shmundhra | shmundhra | himanshumundhra98

EDUCATION

Degree	Institute / Board	Year	CGPA / %
B. Tech in Computer Science and Engineering	IIT Kharagpur	2016 - 2020 (Expected)	**9.57 / 10**
All India Senior School Certificate Examination	Birla High School - CBSE	March, 2016	**95.2 %**
All India Secondary School Examination	Birla High School - CBSE	March, 2014	**10 / 10**

INTERNSHIP

Member of Technical Staff Intern at Rubrik, Inc. **Summer'19**

- Designed a High Throughput Streaming Library for data transfer over a **Secured TCP Connection** as an API to user.
- Implemented a **duplex server-client stream** where each end can be a rewindable/non-rewindable producer/consumer.
- **Designed** the response, request and error packet **headers** and the **protocol** to be followed from scratch.
- Implemented **multiple classes in a hierarchical structure** and developed different utilities and wrapper modules.
- Used **thread-per-connection concurrency control** mechanism and maintained synchronisation between threads using **mutex lock wrappers** to avoid the producer-consumer and stream registration race conditions.

TEACHING EXPERIENCE

Teaching Assistant for Algorithms-I CS20003, IIT Kharagpur **Jul'19 - Present**

- Organise **tutorials** for the students, set practice problems and solve with the class along with doubt clearing.

Lecturer at Competitive Programming Workshop, IIT Kharagpur **Jan'19 - Apr'19**

- Organised and Lectured a **Competitive Programming Workshop** for the students of IIT Kharagpur.

PROGRAMMING REPOSITORIES

Systems Programming **Spring'19 - Ongoing**

- Implemented a rudimentary **Command-Line Interpreter** for Linux on C++ using **forks and pipes**.
- Developed a **Process/Thread Scheduler** which implements the common Process Scheduling Algorithms.
- Simulated a **Multi-threaded mutually exclusive deadlock free** Producer-Consumer problem implementation.
- Simulated **Virtual Memory using Demand Paging**
  - Created **different modules** such as Master, Scheduler, Processes and the Memory Management Unit (MMU).
  - Implemented message passing between modules through **Blocking Synchronous IPC Message Queues**.
  - Accessed **Shared Memory** synchronously using **signals & messages** to indicate safe and mutually exclusive access.
  - **Proportional allocation** of frames along with an **LRU strategy** for the Page Table and the TLB was adopted.
- Implemented a **Memory-Resident Unix-Like File System**
  - Created a **Multi-Level Directory Tree like File System** which supports all Linux-type file commands.
  - **Linked List Implementation** where the **Free Blocks are a Bit Vector** and **Data Blocks are maintained in a FAT**.
  - **iNode Implementation** where the **Free Blocks are a Linked List** and the **File Blocks are maintained in iNodes**.

Socket Programming **Spring'19 - Ongoing**

- Developed an **iterative FTP Server and FTP Client** following a subset of the File Transfer Protocols
  - **Client sends the port** at which it is waiting for data to the Server through the **Command Channel**.
  - **Server initiates the connection** and a put() or get() of binary files can take place over the **Data Channel**.
- Developed a **Reliable User Datagram Protocol** using **MyReliableProtocol(MRP) Sockets**
  - Created a **Static Library** with all required functions for our protocol - socket(), send(), recv(), close() .
  - Created a **Concurrent Thread** which managed the Receiving of Messages and placed them into the Receive Buffer.
  - This Thread also managed the **Acknowledgements and the Re-transmissions** to ensure reliability.
- Developed a simplistic implementation of a **Peer-to-Peer Live Chat Relay Server**.
- Developed a version of the Linux-Command **$traceroute** using **Raw Sockets** and the **TTL Field** in the IP Header.

Machine Learning **Spring'19 - Ongoing**

- Developed a **Regression Tool using Gradient Descent** to study the effect of variation of hyperparameters on the plots.
- Developed a **Decision Tree Classifier** to classify a large dataset of news articles into alt.atheism or comp.graphics.
- Implemented a **Hierarchical Clustering** to cluster submissions to conferences by their High-Level Domains.
- Implemented a **Multi-Layer Artificial Neural Network** for Email SPAM/HAM Classification.

Competitive Programming **Winter'17 - Ongoing**

- Contains all the codes from different platforms like CodeChef, Codeforces, InterviewBit and from my participations in competitions like ACM-ICPC, Facebook Hacker Cup, Google Code Jam and Google Kickstart.

PROJECTS

Multi Target Stance Detection using Graph Convolution Networks **Ongoing**

- Aim to **assign a stance to textual data** by a user catering to a particular target or a set of related targets using GCNs.
- **TextGCNs generate a multi-layer graph** that will incorporate the user history and comments on the topic of interest.
- Aim to utilise **user background information** to be able to predict their stance in a more accurate manner.
- GCNs **Semi-supervised framework** allows us to train a small dataset and achieve results similar to full-supervision.

Auditorium and Room Booking System (HOVA) **Spring'19**

- Developed a **Web Application** on Java NetBeans using **JSP and MySQL** to automate room booking in IIT Kharagpur.
- Incorporated the **hierarchical structure** of room booking by including verification from the Department, Authority, Security and the AV Cell, in that order.
- Included features of **submitting/cancelling booking requests** and seeing pending applications from the Applicant Side.
- Included features of **accepting/rejecting booking request** and seeing pending applications from the Verification Side.

Query Answering over Linked Data (QALD) **Autumn'18**

- Translated **natural language query into SPARQL query** and **retrieved answers** to the query from an **RDF store**.
- Explored various NLP based libraries and frameworks such as Stanford CoreNLP and tried to **relate semantic information** from the **generated parse tree** to be able to **design a SPARQL query to extract answers from DBpedia**.

Restaurant Automation System (RAS) **Spring'18**

- Developed a **Desktop Application** on Java NetBeans using **Swing and MySQL** to automate all activities in a restaurant.
- Incorporated features like order placement, inventory management, vendor management, and menu modification.
- Tested the software using **JUnit Testing technique** with a **well-rounded test suite** to debug the errors.
- Employed industrial software development techniques including preparing **SRS**, **DFD** and **UML Diagrams**.

COURSEWORK INFORMATION

Completed with Laboratory Component: Programming and Data Structures, Algorithms I, Introduction to Electronics, Signals and Networks, Software Engineering, Switching Circuits and Logic Design, Computer Organisation and Architecture, Compilers, Operating Systems, Computer Networks, Database Management Systems
Completed: Mathematics I-II , Discrete Structures, Probability and Statistics, Formal Language and Automata Theory, Algorithms II, Knowledge Modeling and Semantic Technologies, Linear Algebra, Machine Learning
Ongoing: Advancements in OS Design, Artificial Intelligence, Natural Language Processing, Object Oriented Systems, Parallel Algorithms, Theory of Computation

SKILLS and EXPERTISE

Languages/OS: C, C++, Java, JSP, Python, UML, MySQL, MIPS, Bazel, Windows, Ubuntu
Tools/Libraries: C++ STL, NumPy, Pandas, Scikit, NLTK, NetBeans, Swing, Git, Arcanist/Phabrigator, MS Office

AWARDS and ACHIEVEMENTS

- Holding **DepartmentRank 4** among the B.Tech students of the Department of Computer Science & Engineering **Aug'19**
- **Peak Rating 1977** on CodeChef, **1726** on Codeforces and **Level 7** on InterviewBit **Aug'19**
- **Qualified** for Google Code Jam 2019 - Round 2 **May'19**
- **Awarded** the Merit-Cum Means Scholarship by the institute for excellent academic performances in 2018 **Mar'19**
- **Acquired** a Rank of 45 in ACM-ICPC Amritapuri-Coimbatore Regionals Onsite Finals **Dec'18**
- **Acquired** a Rank of 139 in ACM-ICPC Online Contest and qualified for Amritapuri-Coimbatore Regionals **Oct'18**
- **Qualified** for Facebook Hacker Cup 2018 - Round 2 **July'18**
- **Awarded** by the Department of Computer Science & Engineering for performance par excellence in 2017 **Apr'18**
- **Awarded** the Batch of 1985 Scholarship by the Institute for excellent academic performances in 2016-17 **Mar'18**
- **Changed Department** to Computer Science & Engineering by acquiring a institute rank of 9 in the first year **July'17**
- **Runners-Up Company** at the 11th Asian Regional Space Settlement Design Competition organised in collaboration with Atlantis Research and the Kennedy Space Center **Jan'15**
- **Scored** a percentile of 98.16 in Qualitative Reasoning, 99.46 in Language Conventions and 98.47 in Quantitative Reasoning in Nationwide Problem Solving Assessment Examination (PSA) conducted by CBSE **Nov'14**

POSITIONS of RESPONSIBILITY

Tech Lead at CodeClub, IIT Kharagpur **Oct'17 - Present**

- Organised an **HSBC powered Hackathon** in campus for the students of IIT Kharagpur.
- Organised **up.AI**, a one of a kind flagship event solely dedicated to the use of AI for Social Good.
- Organized **Code.Fun.Do**, a Microsoft sponsored hackathon which involved the participation from various institutes.
- **Head - Technical Blogs** on Programming at https://medium.com/@codeclub.iitkgp.

Volunteer at National Service Scheme, IIT Kharagpur **July'16 - Apr'18**

- **Taught** the students of a primary school for an hour each weekend in a village in the Porapara District of West Bengal.
- **Conducted Surveys** in a village in the Porapara District of West Bengal to learn about their grievances and act on them.