

Kautuk Raj

Computer Science and Engineering
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Academic Details

Year	Degree	Institute	CGPA/%
2019-2024 (expected)	Integrated M.Tech in Computer Science and Engineering	International Institute of Information Technology, Bangalore	3.76/4
2019	Class XII, ISC	Narbheram Hansraj School, Jamshedpur	97%
2017	Class X, ICSE	Rajendra Vidyalaya, Jamshedpur	97%

Relevant Courses

- **Computer Science:**

Data Structures and Algorithms, Computer Architecture, Computer Networks, Design and Analysis of Algorithms, Database Systems, Software Engineering, Theory of Computation, Machine Learning, Cloud Computing, Cybersecurity, Multi-Agent Systems, Operating Systems, Programming Languages

- **Mathematics:**

Calculus, Linear Algebra, Differential Equations, Probability and Statistics, Mathematics for Machine Learning

Internships

- **Tata Steel, Jamshedpur**

(May - July, 2021)

Mentor: Rahul Kumar

- Implemented a machine learning model for the prediction of late arrival of an employee based on several parameters like house location, vehicle used, etc.

- **Center for Sustainable Mobility, IIIT Delhi**

(August, 2021 - December, 2021)

Mentor: Prof. Anuj Grover

- Working on the research problem of building low-cost GPS modules for e-rickshaws and auto-rickshaws to improve last mile connectivity in Delhi, India.
- Implemented a real-time operating systems for the GPS modules to function.

- **Center for Big Data Engineering and Analytics, IIIT Bangalore**

(May, 2022 - present)

Mentor: Prof. Vinu EV

- Working on Reason-AIR, a project in collaboration with the University of Luxembourg and IIIT Delhi intending to develop a distributed high-performance reasoning system for Description Logic (DL) ontologies. Specifically, developing a baseline system integrating Apache Spark and the Owlready2 API.
- Designing a use case (and a pattern of applications) where the reasoning over streaming data is useful and envisage a system design that helps to attain a high maximum sustainable throughput (MST) in the stream reasoning context.
- Used Apache Spark (in Python, Jupyter setups) to simulate a streaming setup on the big data and perform rate-testing of reasoning on a cluster computing setup to demonstrate the scalability of stream-based reasoning.
- Learnt and gained experience in the areas of ontology, reasoning, streaming as well as big data applications of these using Apache Spark.

Key Projects

- **Inventory Management Portal**

(November, 2019)

Mentor: Prof Sujit Kumar Chakrabarti

- Designed and implemented a portal for warehouses to effectively manage their inventory using Python, Django and SQLite.
- A browser-based graphic interface was also provided, for ease of access.

- **SAP Computer**

(February - March, 2020)

Mentor: Prof Subhajit Sen

- Implemented and tested the *simple-as-possible* computer, a basic model of a microprocessor in Verilog, a hardware description language.
- Developed an understanding of how a microprocessor works, interacts with memory and other parts of the system like input and output.

- **Multiplayer Quiz Game Show**

(March - April, 2020)

Mentor: Prof Tricha Anjali

- Designed a multi-player p2p network-based game using Pygame for graphics and TCP sockets as the network component.
- Reinforced the concepts of socket and network programming through a real-world problem.

- **IAS Machine**

(August - September, 2020)

Mentor: Prof Nanditha Rao

- Designed the processor and memory of the first electronic computer built at the Institute for Advanced Study (IAS), Princeton using Java.

- Developed a solid understanding of the von Neumann architecture and other concepts of computer architecture and organization.
- **Logistics Simulation** (September - October, 2020)
Mentor: Prof TK Srikanth
 - Designed and implemented a logistics handling system to route packages from one location to another, using Java.
 - Developed a good understanding of the object-oriented style of programming, and the GUI widget toolkit Swing.
- **UCINET DL file reader** (October - November, 2020)
Mentor: Prof Java Sreevalsan-Nair
 - Used concepts of object oriented programming in C++ and read in .dl files and performed required manipulations and wrote back into the file.
- **Personal Data Store** (August - November, 2021)
Mentor: Prof Chandrashekar Ramanathan
 - Designed and implemented a database in C to store information about a person.
 - CRUD operations were carried out on this database.
 - Further, JDBC (Java Database Connectivity) was also used to interface MySQL with Java, for an enhanced version of the project.
- **Kaggle Malware Prediction Competition** (October - November, 2021)
Mentor: Prof Neelam Sinha
 - Competed in a Kaggle competition for malware classification. Carried out batch-wise processing due to the big data nature of input, tried out various strategies for high classification accuracy and finally settled on a LightGBM setup.
- **Data Processing using Hadoop MapReduce** (February 2022)
Mentor: Prof Vinu EV
 - Processed, analyzed big data sources (Wikipedia entries) and ran semantic queries on it using Hadoop MapReduce, a distributed computing algorithm, in Java.
- **Edge Computing using EdgeX Foundry** (April 2022)
Mentor: Prof Vinu EV
 - Created a mood lighting setup for a room using a mock setup of LEDs and Raspberry Pi (hardware end) and EdgeX Foundry, Docker and Python (software end).
 - Computing was carried at the edge of the network, free from network constraints and latency.
- **Course Allocation System** (April 2022)
Mentor: Prof Chandramouleeswaran Sankaran
 - Implemented a multi-threaded educational server and client application.
 - Used semaphores to protect data members while they were being accessed.

Scholastic Achievements

- Part of the **Dean's Merit List** at IIIT-B for excellent academic performance, for three consecutive years (2020, 2021, 2022).
- Secured a %ile of 99.43 in JEE Main (2019), among 1.2 million candidates.
- Among the top 1%ile of the ISC examination (class 12), conducted by CISCE.

Technical Skills

- **Programming Languages:** C, C++, Python, Java, L^AT_EX, SQL

Extra Curricular Activities

- National semi-finalist at the Wipro Earthian Sustainability Quiz 2021, India's first quiz on sustainable development.
- Two-time finalist at the Tata Crucible Campus Quiz (2021, 2022), India's largest business quiz.
- National semi-finalist on News Wiz 2016, India's first and biggest news quiz, broadcast on India Today TV.
- National finalist on Travel Quest 2015, India's first nationwide travel quiz, an initiative by Thomas Cook.
- Regional finalist on TCSITWiz 2014, India's biggest IT quiz, conducted by Tata Consultancy Services.
- Three-time winner of the JRD Tata Memorial Quiz (2014, 2015, 2016), organised in memory of the industrial pioneer by Tata Steel.