Sonu Kumar Shaw ⬈

Bachelor of Technology
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EDUCATION

Degree/Certificate	Institute/Board	Year
B.Tech.	Indian Institute of Technology, Guwahati	2020 - 24
Senior Secondary	Central Board of Secondary Education	2020
Secondary	Indian Certificate of Secondary Education	2018

PROJECTS

- **TF-IDF based Problem Search Engine** *Aug. '23*
  Personal Project 🌐 Website | Github
  ○ Implemented web scraping using Selenium and Beautiful Soup to extract problem sets from *LeetCode* and *CSES*.
  ○ Implemented the **TF-IDF** algorithm from scratch, calculating the **TFIDF score** for every word in each problem statement.
  ○ Implemented **Cosine similarity** to rank problems in alignment with search queries, ensuring optimal relevance.
  ○ Developed a **Node.js** application that accepts user queries and displays relevant problems via **EJS** templating.

- **Rubik's Cube Solver - using Korf's IDA* Algorithm** *Aug. '23 - Sep. '23*
  Personal Project 🔗 Korf's Research Paper | Github
  ○ Modelled a virtual **Rubik's Cube (3x3)** in 3 different models/classes using standard data structures present in C++.
  ○ Achieved solving a Rubik's Cube **8** times jumbled in **under 3 seconds** using **BFS, DFS, and IDDFS** algorithms.
  ○ Implemented the **Korf's IDA*** Algorithm, achieving a solving time of **under 10 seconds** for a Rubik's Cube jumbled **13** times.

- **Predicting Flight Delays in India** *Jul. '23*
  Personal Project Github
  ○ Developed a **Flight Delay** prediction system, aimed at **improving** customer satisfaction and air-travel management.
  ○ Data was **scraped** from *Flightradar24*, the test **MSE** was obtained to be **0.25** with **SVM** and **Random Forests**.

- **BigInteger** *Feb. '23*
  Personal Project Github
  ○ Created a lightweight **arbitrary-sized integer** class for C++ using **OOPs** concepts and **no additional dependencies** apart from the standard C++ library.
  ○ Supports all arithmetic, relational, assignment and input/output operations.

- **Crack Area Prediction of RC Slabs subjected to Blast Loading** *Jul. '23 - Present*
  Prof. Hrishikesh Sharma, Department of Civil Engineering, IIT Guwahati
  ○ Studied several research publications to validate reinforced concrete slab models in **LS-DYNA**.
  ○ Developing a Deep Neural Network (DNN) to forecast crack area, utilizing multiple input parameters, including percentage reinforcement, slab dimensions, blast load, and blast height.

ACHIEVEMENTS

- **Expert** on **Codeforces**: Achieved a peak rating of **1641** on the platform (Handle - *shawsk*).
  ○ Codeforces Round #896: Ranked **407th globally** among **26000+** participants.
  ○ Codeforces Round #889: Ranked **429th globally** among **26000+** participants.
  ○ Codeforces Round #886: Ranked **603rd globally** among **38000+** participants.
- **Flipkart Grid 5.0**: Advanced to semi-final round by securing a rank in the **top 1.25%** among **4 lakh** candidates.
- Solved **1000+ programming problems** on all coding platforms combined.
- **Joint Entrance Examination '20**: Secured a rank in the **top 1%** among **1.17 million** candidates.
- **Young Scientist Talent Test '18**: Among the **top 10** students in the state.

TECHNICAL SKILLS

Programming languages: C/C++, Python*
Database Management: MySQL

Web Technologies: HTML, CSS, Node.js, React*
Miscellaneous: NumPy*, Git

* Elementary proficiency

KEY COURSES TAKEN

- **Computer Science**: Introduction to Computing, Data Structures and Algorithms, Database Management Systems and SQL, Operating Systems.
- **Mathematics**: Probability, Discrete Mathematics, Linear Algebra, Elementary Number Theory.

POSITIONS OF RESPONSIBILITY

- **Manager**, Udgam 2022, IIT Guwahati *Sep. '21 - Feb. '22*
  ○ **Headed** a team of **12 associates** in organising a highly successful Internfair with **1300+** student registrations.
- **Senior Executive**, E-Cell, IIT Guwahati *Apr. '21 - Apr. '22*
  ○ **Organised** a diverse range of **entrepreneurial events** with a focus on effective moderation and engagement.

EXTRACURRICULAR

- **Yuvaan - IITG Mars Rover (Robotics Club):** Contributed to autonomous task under AI module.	*2022*
- **Techevince '22:** Devised a solution to address the campus's laundry challenges, along with a revenue model.	*2022*
- **Startup Case Study, E-Cell:** Conducted an in-depth case study on the startup 'Travel Triangle'.	*2021*