SWAPNENDU SANYAL

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EDUCATION

Carnegie Mellon University
B.S. in *Computer Science*
Minor: *Mathematical Sciences*
GPA: 3.95/4.0

Key Courses:

- Artificial Intelligence
- Machine Learning
- Computer Security
- Distributed Systems
- Algorithm Design & Analysis
- Embedded Systems
- Parallel & Sequential Data Structures & Algorithms

TECHNICAL STRENGTHS

Computer Languages:
C, C++, Python, SML, Java
Software & Tools:
HTML, Excel, STRIPS, PDDL, NumPy, scikit-learn

EXTRACURRICULARS

Awards & Honors:

- University Honors
- ICPC Boot Camp, Muscat 2019
  Awarded 2nd place
- Qatar University Mathematics Championship '18, '20
  Awarded 3rd place
- Phi Kappa Phi
- CMU Best Coder Trophy '19, '20
- Outstanding Course Assistant Award (nomination) (thrice)
- CMU Qatar Campus Scholar (nomination)

Leadership:

- Member - Academic Review Board
- Member - University Disciplinary Committee
- Executive Member - Computer Science Club
- Member - Student Academic Council

Academic Trip
'Identifying the Drivers of Entrepreneurial Success at its Source' – San Francisco, USA

Interests:
Competitive coding, music, table-tennis, swimming, history

EXPERIENCE

Software Engineer | Rimads | Dec 2019 - present
Interactive Differential Diagnosis System using Artificial Intelligence

- Undertook key linking role in a diverse team of biologists, physicians, and software engineers.
- Innovated and experimented with algorithms based on the relationship between diseases and their symptoms and etiologies, to effectively diagnose patients.

Research Assistant | CMU Computer Science Department | May '19 – July '19
Multi-tiered System for Efficient & Effective Information Retrieval

- Explored the techniques and science behind modern search engines.
- Explored and innovated possibilities of efficiency gains in a multi-tiered inverted index.
- Modified maxscore algorithm for 2 tiers and ran experiments to predict efficiency gains.

Course Assistant | CMU Computer Science Department | Sep '18 – Apr '20
Courses: Introduction to Computer Systems | Great Theoretical Ideas in Computer Science | Imperative Computation | Parallel & Sequential Data Structures & Algorithms

- Helped students understand course concepts and debug programming assignments during meetings and group discussions.
- Graded theoretical homework assignments, quizzes, and coding style.

Software Engineering Intern | JSW Steel | Dec '16 – Jan '17 | India

- Developed an automated process, which determined alloy requirements for different grades of steel, in a multidimensional team of engineers.
- Saved several manhours needed by senior metallurgists by increasing the efficiency of the steelmaking pipeline.

PROJECTS

Distributed File System | Java

- Designed and implemented a DFS with a naming server and multiple storage servers.
- Developed a Remote Method Invocation (RMI) library over TCP to handle communication.
- Added synchronization techniques and intelligent replication strategies for load balancing and performance.

Machine Learning using *Message Passing Interface (MPI)* and *Map-Reduce* | C & Java

- Implemented the k-means clustering algorithm on 2D points and DNA strands.
- Experimentally compared efficiency between sequential, MPI, and MapReduce implementations over 4 machines.

Remote Control Car with Automatic Collision Prevention | C | Video

- Utilized TIVA C Series Microcontroller to control the car and sensors.
- Used IR sensors to detect remote signals and distance sensors to detect obstacles.
- Worked with different timer modules to synchronize the motors, analog distance sensors, and IR receivers.

Malloc Implementation | C

- Implemented large parts of the malloc library including malloc, calloc, free, and realloc.

Ludo: A Board Game | Python | Video

- Developed a game that replicated Ludo (dice-based board game) that can be played by 2 or 4 players (with AI features).

Classifying Alien DNA | Python | NumPy | scikit-learn

- Experimented and explored various data exploration, feature engineering, and data classification techniques to classify alien DNAs into corresponding galaxies.