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

EXTRACURRICULAR

Awards & Honors:

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

EXPERIENCE

Software Development Intern | Rimads
Interactive Differential Diagnosis System using Artificial Intelligence

- Worked with a diverse team of biologists, medical doctors, and software engineers in a dynamic startup environment.
- 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
Multi-tiered System for Efficient & Effective Information Retrieval

- Critically reviewed existing literature to identify scopes of improvement.
- Carried out experiments to determine the possibility 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
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 Development Intern | JSW Steel

- Used C++ to develop an automated process that determined alloy requirements for different grades of steel.
- Added capability of prioritizing ferro-alloys based on their cost and composition.

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).