(+974) 3345 9853 | [swapnendusanyal1@gmail.com](mailto:swapnendusanyal1@gmail.com) | F1 Visa

**SWAPNENDU SANYAL**

<https://swapnendu.netlify.app>

[linkedin.com/in/swapnens](http://www.linkedin.com/in/swapnens)

<https://github.com/swapnens>

# 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](https://en.wikipedia.org/wiki/Stanford_Research_Institute_Problem_Solver), [PDDL](https://en.wikipedia.org/wiki/Planning_Domain_Definition_Language), [NumPy](https://numpy.org/), [scikit-learn](https://scikit-learn.org/stable/)

# EXTRACURRICULAR

**Awards & Honors:**

* University Honors
* [ICPC Boot Camp, Muscat 2019](https://www.qatar.cmu.edu/news/second-at-oman-programming-bootcamp/) Awarded 2nd place
* Qatar University Mathematics Championship [’18](https://www.qatar.cmu.edu/news/qatar-university-math/), [’20](https://www.qatar.cmu.edu/news/computer-science-top-qatar-university-math-competition/)

Awarded 3rd place

* Phi Kappa Phi
* [CMU Best Coder Trophy ’19](https://web2.qatar.cmu.edu/cs/icpc/), ’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, historyEXPERIENCE

# Software Development Intern | [Rimads](https://www.linkedin.com/company/rimads/) | Dec 2019 - present

# *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 | May ’19 – July ’19**

*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 | 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 Development Intern | JSW Steel | Dec ’16 – Jan ’17

* Used C++ to develop an [automated process](https://github.com/swapnens/ALLOY_ADDITION) 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**](https://web2.qatar.cmu.edu/~swapnens/DistributedFileSystem/index.html)**| Java**

* Designed and implemented a [DFS](https://web2.qatar.cmu.edu/~swapnens/DistributedFileSystem/index.html) 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**](https://github.com/kkiyer1998/Remote_Control_Car) **| C |** [**Video**](https://www.youtube.com/watch?v=7v2zeyWSMHg&t=37s)

* 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](https://github.com/swapnens/15-112-Project) | Python | [Video](https://www.youtube.com/watch?v=kcbUfs-2_9E&t=104s)

* Developed a game that replicated [Ludo](https://www.youtube.com/watch?v=kcbUfs-2_9E&t=104s) (dice-based board game) that can be played by 2 or 4 players (with AI features).

[**Classifying Alien DNA**](https://github.com/swapnens/MachineLearningProject) **| Python | NumPy | scikit-learn**

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