

# Hossam Zaki

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## Education

**Brown University** | Sc.B Computational Biology Candidate | PLME | GPA 3.95/4.0 *Providence, RI, May 2022*

- Relevant Coursework: Introduction to Data Structures and Algorithms, Arabic 1 & 2, Experimental VR, Practical System Skills, Computational Molecular Biology, Software Engineering, Computer Vision, Honors Statistics
- Scholarships: Jackie Robinson Foundation Scholar, American Chemical Society Scholar, 2019 Merck ACS Scholar

**South Kingstown High School**

*South Kingstown, RI, June 2018*

- Class of 2018 Valedictorian (5.25 out of 5.33 weighted GPA, 4.0 unweighted)

## Skills

**Technical**: Proficient in Java, Python, R, Git, HTML, CSS and Bash. Currently learning C, SQL, C#, and JavaScript

**Languages**: English, Arabic, Spanish

## Work Experience

**Protein Data Bank of Europe** | Software/Biological Intern

*Cambridge, UK, Summer 2019*

- Developed a pipeline to superpose protein structures in a UniprotKB Accession, cluster the proteins based on structure similarity, and show them visually on PyMol
- Designed Algorithm using Python and SQL and analyzed data using Hierarchical Clustering.
- Compiled the algorithm on over 47,000 Uniprot Accessions which included over 350,000 PDB entries
- Co-authored and published a paper to Nucleic Acids Research titled "PDB: Improved findability of Macromolecular structure data in the PDB"

**Brown University Molecular Biology/Wessel Lab** | Undergraduate Researcher

*Providence, RI 2017 – Present*

- Researched the effect of Sea Star Wasting Disease on the embryonic development of Sea Star and Sea Urchin
- Developed pipeline to search and find new genetic motifs in the RNA of germ-line cells using Python and the Knuth-Morris-Pratt algorithm
- Co-authored an abstract presented in Developmental Biology of the Sea Urchin Conference titled: "Bisphenol A exposure differentially affects echinoderm embryogenesis. Developmental Biology of the Sea Urchin"

## Projects

**Computational Analysis of Sea Urchin Transcriptome**

*Wessel Lab, Brown University, 2019 - Present*

- Developed pipeline to search for known genetic motifs in the transcriptome of the Sea Urchin, as well as discovering new motifs
- Implemented Knuth Morris Pratt Algorithm to linear-time pattern recognition as well as a Suffix Trie to search for the longest most common substring
- Currently implementing Local Alignment to search for miRNA binding sites within each transcript

**COVID-19 Sequence Analysis**

*Independent Project, 2020- Present*

- Developed method to compare the sequence of the Novel Coronavirus with other viruses such as SARS, MERS, and HIV
- Implemented Global and Local Alignment to align sequences together and return an alignment score

## Leadership Experience

**Warren Alpert Medical School** | Volunteer

*Providence, RI, Summer 2017 - Present*

- Shadowed doctors in different specialties and would help around different offices at Rhode Island Hospital

**Boys and Girls Club of Rhode Island** | Volunteer

*Providence, RI, Summer 2018, 2019*

- Prepared several lessons on topics such as Global Warming, simple chemical reactions, and recycling

**LaGuardia Community College** | Volunteer

*New York City, NY, Fall 2018*

- Presented to students on how to get research opportunities and resume writing

**STEM to Help** | President and Founder

*South Kingstown, RI, Fall 2014 - Spring 2018*

- Developed and created a non-profit organization to inspire high school students to become scientists, and to raise money to help educate children all over the world. Sponsored a school in Senegal through a multitude of fundraisers such as STEM Nights, bazaars, school supplies drive, and yard sales.

**Boy Scouts of America** | Eagle Scout

*South Kingstown, RI, Fall 2012 – Fall 2017*

- Built an outdoor classroom, which is still used today, and renovated a long hallway in my local middle school