Alexander Turco

Research Student, BSc in Biology, Research Specialization
My Website

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Education

McMaster University: Honours BSc in Biology, Research Specialization Sep 2019 - Present

Supervisors: Professor G. Brian Golding, Professor Rosa da Silva

- Honours Thesis Title (Dr. Golding): Estimating Evolutionary Parameters for Protein Low Complexity Regions using an Approximate Bayesian Computation
- Honours Thesis Title (Dr. da Silva): Cells at War: The Playfulness of Game-Based Learning

Research Experience

Research Student - Kumar Lab, Computational Cancer Genomics May 2023 - August 2023

Princess Margaret Cancer Research Centre, University Health Network *Toronto, ON, Canada*

- Explored sex differences in gene expression across twelve human cancers to elucidate genetic interactions that selectively kill cancerous cells (synthetic lethal interaction).
- Developed a bioinformatic pipeline to analyze gene expression (RNA-seq) data from The Cancer Genome Atlas (TCGA), specifically focusing on determining differentially expressed genes that interact in a synthetic lethal manner.
- Created detailed documentation on operating procedures for computational pipeline.
- Concisely communicated scientific research to field specific and public audiences.

Research Student - Golding Lab, Bioinformatics and Molecular Evolution May 2022 - April 2023

Department of Biology, McMaster University *Hamilton, ON, Canada*

- Explored the microbial composition of freshwater algal bloom sites across Ontario (summer project), as well as the evolution of protein low complexity regions (undergraduate thesis).
- Utilized bioinformatic tools and experimental design related to data visualization, genomic data analysis, phylogenetics, and molecular evolution.
- Analyzed and manipulated DNA sequence data collected by the Ministry of Environment and Climate Change (MOECC) to understand the toxicity of algal blooms.
- Developed a `C++` program to simulate the evolution of protein low complexity regions as part of a step in an Approximate Bayesian Computation, in order to predict parameters that accurately describe the evolution of these regions.
- Comprehensive training in bioinformatic software and high performance computing such as R, Python, and Unix.
- Created detailed documentation describing background information, methods, and results.
- Concisely communicated scientific research through oral and poster presentations at two conferences.

Research Student - da Silva Lab, Pedagogy and Science Education May 2022 - Present

Department of Biology, McMaster University *Hamilton, ON, Canada*

- Explored the impacts of bringing game-based learning into university classrooms, through the development of a biological video game called "Cells at War".
- Collaborated with artists, designers, programmers, musicians, and scientists across the globe to conceptualize, design, and build an educational tool to teach first year students core cellular and molecular biology concepts.

- Provided biological expertise, and applied critical thinking strategies to synchronize scientific facts with the creative game design process.
- Created student feedback survey and analyzed results to better understand how video games improve student engagement and motivation.
- Communicated scientific research through oral presentations at two conferences as well as a full research paper highlighting student perceptions on game-based learning.

Specialized Skills

Programming Languages and High Performance Computing: R, Python, C++, Git/GitHub, Unix/Linux, Bio-Conductor, bash, ComputeCanada, LaTeX
Research: Data collection, manipulation, and analysis, science communication, writing academic articles
Soft Skills: Collaboration, communication, detail-oriented, highly organized, creative problem solver, highly adaptive

Presentations and Conferences

Oral Presentation August 2023
University Health Network Summer Training and Research Program *Toronto, ON, Canada*
- 3 minute thesis virtual presentation

Oral Presentation July 2023
The Western Conference on Science Education *London, ON, Canada*
- A STEAM game-based learning framework: Maximizing integrated and immersive learning in the classroom.
- Presented by supervising professor Dr. Rosa da Silva
- Conference publication available in The Western Conference on Science Education Journal, 2023

Oral Presentation April 2023
Biology Undergraduate Symposium, McMaster University *Hamilton, ON, Canada*
- Undergraduate thesis presentation in computational biology

Oral Presentation April 2023
Biology Undergraduate Symposium, McMaster University *Hamilton, ON, Canada*
- Undergraduate thesis presentation in science education

Poster Presentation October 2022
MacWater Challenges in Water Monitoring Conference *Hamilton, ON, Canada*

Awards & Honors

Oral Presentation Award in Computational Biology
Biology Undergraduate Symposium, McMaster University *April 2023*

Oral Presentation Award in Science Education
Biology Undergraduate Symposium, McMaster University *April 2023*

3rd Place Best Abstract Award
MacWater Challenges in Water Monitoring Conference, McMaster University *October 2022*

Research stipend for the creation of Cells at War: A Biological Video Game
Co-operative Education and Work-Integrated Learning Canada (CEWIL), $6000.00 *Sept 2021 - Present*

Select Volunteer Experience

Youth Soccer Coach May 2018 - Present
Little Kickers Group and Carlos Rivas Soccer Academy *Toronto, ON, Canada*

- Coached recreational and competitive boys aged 2-8.
- Developed a variety of activities (warmups, drills) to actively engage children and introduce them to fundamental concepts in soccer.

Children's Sports Volunteer July 2023
YMCA *Markham, ON, Canada*

- Responsible for leading large groups of children ages 7-10 years old through a variety of cooperative games and sports.

STREAM Science Fair Judge May 2023
St. Augustine Catholic High School *Markham, ON, Canada*

- Evaluated research projects from students in the STREAM (science, technology, research, engineering, art, mathematics) program at my former high school.

Biology Undergraduate Student Ambassador May 2023
McMaster University *Hamilton, ON, Canada*

- Served as a representative of the Biology department at McMaster University's open house to help prospective students understand why McMaster and the department may be the right fit for them.

Other Work Experience

Operations Maintenance and Funding Specialist May 2018 - Present
Royal Bank of Canada *Toronto, ON, Canada*

- Developed a simple Python program to facilitate incentive calculations which was utilized by the Operation Centre teams to reduce errors and improve client satisfaction.
- Processed Client funding requests of automotive loans for auto dealerships across Canada.
- Maintained a high-volume throughput using incentive calculations and evaluated interest rates while ensuring a low error rate to maximize dealer satisfaction.

Personal Projects

Web Portfolio Link
Personal website developed using Javascript, HTML, and CSS. This site highlights personal information, special projects, personal areas of interest and what I am most passionate about. This is an ongoing project that not only showcases my work but reflects my professional self in a creative way.

Youth Soccer Team Roster Landing Page Link
This website was developed using Javascript, HTML, and CSS. This site was built for a competitive youth soccer team to highlight important player information typically required by scouts in attendance. It provides scouts with a simple and easy interface to identify players, compared to the usual excel file that can be very difficult to follow.