Ross Andres

Biophysics · Machine Learning · Mathematical Analysis

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My goal is to be at the forefront of physics research, heavily using mathematics and computer science. I enjoy working in teams and aspire to work in a big project with other amazing people.

Education

McGill University B.S. Honors Mathematics and Physics

ITESM Santa Fe High School Degree/IB Diploma (3rd out of 507 students; Graduated with Honors)

Skills

Programming Python, JAVA, MATLAB, LaTeX, basic HTML

Languages English, Spanish, and working proficient French

Analysis parameter reduction, differential equations, use of cost functions,signal analysis, statistical analysis and machine learning.

Experience

Honors Math Research Project (Prof. Jean-Christophe Nave, Prof. Alessandro Navarra) *Montreal, Canada*

"Finite Difference and Discrete Event Simulation Applied to Copper Smelter Dynamics" *Jan – current 2019*

- Using Runge-Kutta methods and newton iterations to model complex reactions inside a furnace.
- Using Discrete Event Simulation to model the interplay between discrete events and continuous events in Pierce-Smith converters.

The Ottawa Hospital (Prof. Eric Vandervoort) *Ottawa, Canada*

Medical Physics research position *May – September 2018*

- "Predicting CyberKnife tracking errors from external breathing features"
- Used machine learning techniques to predict errors generated by the CyberKnife treatment for liver cancer patients.
- Coded a real time interface for adaptive breathing control for patients to use during treatment.
- Used signal processing techniques, statistical analysis and machine learning as well as python coding.
- Spent most time looking for significant features and documenting and making the codes robust for use by others.

Dr. Paul François (McGill university) *Montreal, Canada*

Biophysics research position *May – September 2017*

- "Exploring the use of Mutual Information as a Fitness Function for Parameter Reduction"
- Carried out my own research project.
- Simulated the immune system in Python through differential equations and linear algebra.
- Explored the use of the Mutual Information as a function to simplify complicated biological networks.
- Spent most time programing, debugging and mathematically analyzing the results.

Honors & Awards

2017 **SURA,** Science Undergraduate Research Award (funding for research) *Montreal, Canada*

2016/2017 **Scholarship,** One-Year Undergraduate Entrance Scholarship McGill *Montreal, Canada*

2016 **Scholarship,** Hugh Brock Renewable Scholarship McGill *Montreal, Canada*

Extracurricular Activity

2018 **MCHAM,** (McGill Children's Health Alliance Montreal) volunteer *Montreal, Canada*

2018 **Running,** Timed 5 km race best time: 19:12 min *Montreal, Canada*

2018 **McGill Physics Hackathon,** improving neural networks with inspiration in immunological networks *Montreal, Canada*

2017 **McHacks,** McGill Organized Hackathon, submited a Facebook chatbot as project *Montreal, Canada*

2017 **CUPC (Canadian Undergraduate Physics Conference),** Gave talk on independent research project *Montreal, Canada*

2016 **Beyond Me,** mentorship program for children with disabilities *Montreal, Canada*

2016 **3rd Place,** McGill Engineering Competition junior Design *Montreal, Canada*