Ross **Andres**

Biophysics · Machine Learning · Mathematical Analysis

(+1) 438-928-8712 | andresrossb@gmail.com | andresrossb.github.io | andresrossb | andres-ross

Objective

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 scientists like iREx, CERN or PI.

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

Languages English, Spanish, and working proficient French

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

Experience

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

International

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*

Astrophysics is what initially got me interested in physics. The possibility of exploring the vastness of space and the lingering question “are we alone?” has always driven my passion. When I started my undergraduate work I started looking into different research positions and got interested in Paul François research in biophysics. I was astounded on how our knowledge of physics and mathematics could translate into different fields. I absolutely loved the techniques that I used there, using coding, differential equations and algebra to try and understand highly complex systems. But what I really liked was the opportunity to work in something nobody else in the world has done, working at the forefront of knowledge and contributing, even if it was only a small part, to humanity’s understanding of the world around us.

This summer I started reading about astrophysics and exoplanets. I was again taken aback by how small our earth is in comparison to the vast universe. I really liked professor Cumming’s research on neutron stars as well as the paper where he along with the other authors use Monte Carlo simulations and infrared radial velocities to predict planet yield in the SLS-PS. This got me even more excited and had me looking to learn more. I reached out to professor Cumming and he gladly accepted to talk to me about his research. I was also able to attend a few colloquiums on similar topics in McGill as well as to listen in on the IREX meeting that happened Tuesday in McGill as well. This all taught me several things, but mostly how little I know compared to how much I want to know.

I want to keep learning about Exoplanets and astrophysics in general, and I would really like to help further our understanding in these topics. I would love the opportunity to form part of such a great group like IREX and to participate in research trying to answer one of humanities greatest questions.

McGill
UNOFFICIAL Transcript

✧ A diamond appears beside a course number to indicate a multi-term course.

* An asterisk appears next to the credit value of courses not counted in the total credits earned.

Remarks column:
I - Course is included in credits and included in the GPA.
E - Course is excluded from credits and excluded from the GPA.
A - Course is excluded from credits and included in the GPA.

Please click help for more transcript information.

Student Name: Ross, Andres
McGill ID: 260713251
Permanent Code: ROSA24019704
Advisor(s): Olioff, Paul R

PREVIOUS EDUCATION
IB Diploma outside Canada/US

Hugh Brock Scholarship

Credits Required for BSc Phys,Earth,Mth&CompSc Hon - 120 credits

Fall 2016

Bachelor of Science
Full-time Year 1
Major Physics

Credits/Exemptions

From: International Bacc Diploma - 30 credits

ENGL	1XX
HISP	1XX
MATH	140
PHYS	101
PHYS	102

Subject	Number	Title	Cr. / C.E.U.	Grade	Remarks	Earned	Class Avg.
AAAA	100 001	Academic Integrity Tutorial	0	CO			
CHEM	110 001	General Chemistry 1	4	A		4	B+
COMP	202 002	Foundations of Programming	3	A		3	B+
MATH	133 001	Linear Algebra and Geometry	3	B		3	B
MATH	150 001	Calculus A	4	A		4	B

				Att Cr	Earned Cr	GPA Cr	Points
TERM GPA:	3.78	Advanced Standing & Transfer Credits:	30.00	TERM TOTALS: 14.00	14.00	14.00	53.00

CUM GPA: 3.78	TOTAL CREDITS: 44.00		CUM TOTALS: 14.00	14.00	14.00	53.00

Standing: Interim Satisfactory

Winter 2017

Bachelor of Science
Full-time Year 1
Major Physics

CHEM 120	001	General Chemistry 2	4	A-	4	B+
COMP 250	001	Intro to Computer Science	3	A	3	B
MATH 151	001	Calculus B	4	B+	4	B
PHYS 241	001	Signal Processing	3	A-	3	B

				Att Cr	Earned Cr	GPA Cr	Points
TERM GPA: 3.65	Advanced Standing & Transfer Credits:	30.00	TERM TOTALS:	14.00	14.00	14.00	51.10
CUM GPA: 3.71	TOTAL CREDITS:	58.00	CUM TOTALS:	28.00	28.00	28.00	104.10

Standing: Satisfactory

Hugh Brock Scholarship

Fall 2017

Bachelor of Science
Full-time Year 2
Honours Mathematics and Physics

MATH 235	001	Algebra 1	3	B	3	B
MATH 248	001	Honours Advanced Calculus	3	B+	3	B-
PHYS 251	001	Honours Classical Mechanics 1	3	A	3	B+
PHYS 257	001	Experimental Methods 1	3	A	3	A-
PHYS 260	001	Modern Physics and Relativity	3	B+	3	B+

				Att Cr	Earned Cr	GPA Cr	Points
TERM GPA: 3.52	Advanced Standing & Transfer Credits:	30.00	TERM TOTALS:	15.00	15.00	15.00	52.80
CUM GPA: 3.64	TOTAL CREDITS:	73.00	CUM TOTALS:	43.00	43.00	43.00	156.90

Standing: Interim Satisfactory

Winter 2018

Bachelor of Science
Full-time Year 2
Honours Mathematics and Physics

MATH 249	001	Honours Complex Variables	3	A	3	B+
MATH 251	001	Honours Algebra 2	3	B+	3	B-
MATH 325	001	Honours ODE's	3	A-	3	B+
PHYS 258	001	Experimental Methods 2	3	A	3	A-
PHYS 351	001	Honours Classical Mechanics 2	3	A	3	A-

					Att Cr	Earned Cr	GPA Cr	Points
TERM GPA:	3.80	Advanced Standing & Transfer Credits:	30.00	TERM TOTALS:	15.00	15.00	15.00	57.00
CUM GPA:	3.68	TOTAL CREDITS:	88.00	CUM TOTALS:	58.00	58.00	58.00	213.90

Standing: Satisfactory

Fall 2018

Bachelor of Science
Full-time Year 3
Honours Mathematics and Physics

RW	MATH 254	001	Honours Analysis 1	3
RW	MATH 475	001	Honours PDE's	3
RW	PHYS 253	001	Thermal Physics	3
RW	PHYS 350	001	Hons Electricity & Magnetism	3
RW	PHYS 357	001	Honours Quantum Physics 1	3

Winter 2019

Bachelor of Science
Full-time Year 3
Honours Mathematics and Physics

RW	MATH 255	001	Honours Analysis 2	3
RW	PHYS 359	001	Hons Lab in Modern Physics 1	3
RW	PHYS 362	001	Statistical Mechanics	3
RW	PHYS 457	001	Honours Quantum Physics 2	3

RELEASE: 1.16
FORM NAME: SWFTRAN