MATTHEW OLSSON

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EDUCATION

Brock University *September 2016 - June 2021*
Bachelor of Science in Physics and Mathematics (Honours)

CAREER OBJECTIVE

To gain a wide variety of knowledge (physics, mathematics, economics, music) and be able to cross reference the large subject gap while satisfying curiosities in each topic.

COURSES

Physics
Physics I, II, & III. Introduction to Medical Physics. Introduction to Mechanics. Analog Electronics. Modern Physics. Introduction to Classical and Modern Optics. Electromagnetism I. Statistical Physics I. Experimental Physics I. Introduction to Quantum Mechanics. Introduction to Mathematical Physics. Quantum Mechanics. Nuclear Physics. Solitons & Nonlinear Wave Equations. Research Project.

Mathematics
Introduction to Mathematics. Practical Statistics. Math Integrated Computer Applications I & II. Calculus I & II. Linear Algebra I & II. Multivariate and Vector Calculus. Probability I & II. Ordinary Differential Equations. Vector Calculus and Differential Geometry. Partial Differential Equations. Advanced Differential Equations.

Others
Principles of Microeconomics. Principles of Macroeconomics. Intermediate Microeconomics I. Intermediate Macroeconomics I. Economics of Illicit Drugs. Economics of Professional Sport. Introduction to Econometrics. Introductory Chemistry. Growth of Greek Philosophy. Aristotle and Beyond. The Growth of Existential Thinking. The Study of Language.

TECHNICAL SKILLS

Software & Tools	Physica, Extrema, GNUPlot, Maple, gretl, DXP-EPICS, LaTeX, MS Office, Linux, Audacity, FL Studio, Ableton Live, Python, RStudio, OpenSCAD, vGATE, HTML, SQL
Lab Equipment	iOLab, mechanics lab equipment (odometers, air tracks), optics lab equipment (Michelson interferometer, spectrometer), electronics (oscilloscopes, high voltage supply etc.), turbo and rotary pump, electromagnetic-rotor machine, photo-multiplier tube, multi-channel analyzer, Lambda Scientific Systems LEAI-51, Lambda Scientific Systems LEAI-62, x-ray machine, spectroscope
Certifications	X-Ray Safety, Radiation Safety, Brock University Science Safety Training, WHMIS Training, Health & Safety Awareness Training

PROJECTS

Battle Modelling: Used Lanchester's Law, and the solutions to it to create a model and battle simulator. The equations contained a basic amount of variables (initial number of troops, replenishment) to obtain an estimate of the battle. The simulator could be ran on a day by day basis or by entering in the total amount of days to be simulated. This project was done in the language VB.NET.

Literary Review: Solitons in nuclear time-dependent density functional theory: Wrote a literary review and prepared a presentation for the class on Yoritaka Iwatas 2004 paper 'Solitons in nuclear time-dependent density functional theory'. The paper dealt with the application of soliton equations (namely 2-soliton KdV equation) to many-nucleon bodies. This was done to achieve a predictable and suitable model for these systems.

Using Monte Carlo Simulation to Mimic Cosmic Radiation Damage Running Monte-Carlo simulations of X-Ray particles to be ran through a model mouse. Different materials in front of and behind the mouse will also be tested in measure dosage, etc. OpenSCAD will be used for modelling the constituents and vGATE will be used for particle simulations. This project utilized Python to a great deal for graphing, summation of simulations, and statistics. This will all be done to aid a professor studying musculoskeletal damage from spaceflight. Under the supervision of Dr. Harroun.

Integrating Data Analytics into Brock Esports A personal project taken up with the Brock Esports club. The project entails integrating data analytics into the teams to do the following tasks: determining necessary data points and collecting them from the game, organizing & processing the data, applying the data to different models and techniques for analysis, generating an output in an easily understandable format for the teams, team leaders, and other analysts. Later plans for the data analytics team will be to use the seasons data to incorporate SQL and other real industry tools.

Determining the Authenticity of a Unknown Painting from the Rembrandt Camp An unknown painting that was traced back to Rembrandt art school belongs to a private collector. A team of researchers had ran neutron autoradiography scans on the painting to excite lead, copper, calcium, iron, and manganese. Using a variety of resources, I was to gather conclusion of whether the painting was legitimate and if it could have been Rembrandts. The expected radioactivity of the painting after exposure to the neutrons was also calculated.

Investigating the Fibonacci Sequence: An overview of the Fibonacci sequence and its relation to the Golden Ratio will be observed, as well as taking a look at the sequences produced by F_n modulo m, or the Pisano Period. The relations to Binet's formula were observed and also put through numerical analysis. The number sets that were generated were also put in different modulo, m. These results were determined by using Python and analyzing the characteristic behaviour of our resulting sequences.

ACHIEVEMENTS

Denis Morris Catholic High-school Honour Roll	2012-2016
Denis Morris Varsity Hockey Coaches Award	2015
Denis Morris Varsity Hockey MVP	2016
Denis Morris Varsity Hockey Captaincy	2015-2016
St. Catharine's AA Falcons Captaincy	2012-2016
Mitch Dmytrow Award	2016
Norm Mussat Award	2016
Brock Physics Enrichment Program	2017
First Ontario Education Award	2017
Brock University Deans List	2017
Thorold BB Blackhawks Captaincy	2017-2018

HOBBIES

Music production, sound design and synthesis (SOCAN Artist)

Interest in the Esports industry, from playing to data analysis to business intelligence

Recent physical hobbies include hockey, golf, running, as well as movement based training