

EDUCATION

Colorado School of Mines

- **Master of Science** in Quantum Engineering, December 2021.

Relevant Courses: Laser Physics, Control Design System, Quantum Programming, Quantum Information, Quantum Many-Body System, Machine Learning.

- **Bachelor of Science** in Chemistry, May 2021.

Research Assistance: Kroll Institute of Extractive Metallurgy - Department of Metallurgical & Materials Engineering, Samaniuk Lab - Department of Chemical Engineering.

HONORS & AWARDS

- Nominated for Golden Key International Honour Society, August 2021
- Len and Lisa Extractive Metallurgy Scholarship, August 2020
- Nominated for Shultz Family leadership in Humanitarian Engineering Fund, May 2020
- Hazen Metallurgy Scholarship, December 2019
- Carsmart Competition 1st Place in Germany, May 2019
- Wright Challenge Competition, Finalist, May 2019
- National Collegiate Scholars, January 2016
- CSM Undergraduate Research Grant (every semester eligible)

EXPERIENCES

Projects

- Developed a **Statistical adaptation of a forecast model for the peak of Ozone** consisting of an exploration then modeling of climate data using machine learning methods. The objective was to predict for the next day a possible exceeding of an ozone concentration threshold based on a deterministic forecast on a coarse grid and local climatic variables.
- Designed a robust Gantry Crane **Control System** using discrete time & State Space methods. Implemented a partial feedback linearization method to control the system.
- Performed measurement and modeling of threshold and slope efficiency of fiber laser oscillators; Analyzed pulse of q-switched of the laser dynamics; Built optical diagnostic tool for the measurement on the laser beams.
- Designed a Sudoku Game using the **Grover Algorithm** that was test on Google's quantum computation **Cirq**. Different sizes of Sudoku were partially filled and solve using the algorithm.
- Assisted in Optimization Research for Concentrating a **Honeywell Uranium Plant**; collaborated with Nuclear Engineering Department at CSM to develop integer program for maximization ore blend and minimize operation cost; experienced developing optimization models in AMPL for linear, non-linear, and integer models.
- Created Shape Memory Alloy materials that won first place in the **Carsmart Competition** in Germany. After evaluation of several papers, the group Immaculé designed a Novel CuAlNi and NiTiHf alloys for future developments of Scoliosis Braces.
- Developed smart polymer gels through functional groups; The imprinted polymer gels demonstrated good selectivity for recovery of the targeted metal ions from multi-component aqueous streams

Software and Programming Languages

- Coding & Computing: C++, Python, Matlab, Mathematica, Zemax , ADF.
- Operations Research: AMPL, CPLEX, Bash.
- Productivity: MS Office, Origin, SolidWorks, ChemDraw, CAD.

Instrumentations

- UV-Vis, Fourier Transformed Infrared (FTIR) ATR, Nuclear Magnetic Resonance (NMR), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Energy Dispersive X-ray Fluorescence (EDXRF), Inductively Coupled Plasma Atomic Spectroscopy (ICP-AES/ICP-OES)
- Thermogravimetric Analysis (TGA), Differential Scanning Calorimetry (DSC), Dynamic Mechanical Analysis (DMA).

Work

- Served as a Curriculum Developer for Quantum Games at **The Coding School**.
- Worked as **Graduate Student Representative** at the **Graduate Student Government**. Participated in approving event funding, technological and academic fees for all Departments on Campus, and ensured transparency for students not involved in GSG.
- Evaluated Bastenite Ore using bench and micro-flotation methodologies using different collectors for the **Kroll Institute of Extractive Metallurgy**. Investigated the uses of the reactions of the ore with the different collectors used to separate the hydrophobic and hydrophilic components within the ore. From there, performed XRF and contact angle analysis of the ore. All those help in determining the characteristics of the ore.
- Designed, using SolidWorks, the structures & mechanisms subsystem for co-extrusion of advanced materials and melt-processable engineering polymers to produce multilayer, complex structures. Worked with seniors and PhD Students in a group of three. Used Rheometer to analyze parameters of different materials for the extrusion. Presented to the URS (the project sponsor) and industry executives, my portion of the design using PowerPoint. (**Colorado School of Mines - Laboratory Assistant**)
- Interned at Center of Collaborative Research - Nova Southeastern University and contributed to develop Pathway Meta-Database of diseases resultant from the Gulf-War.
- Conducted Summer Research at Saint-Thomas University. Performed tissues analysis on soil for Okinawa spinach plant using Kjeldahl Digestion and Dumas Combustion as method to determine the ammonia, nitrogen concentration.

OTHER INTERESTS

- Violin & Painting.
- Speak and learn Different languages.