

RUI (RAY) NIAN

MSC. OPTIMAL CONTROL AND DATA ANALYTICS

903 Lamb Crescent, Edmonton, AB T6R 2X8

Email: rnian@ualberta.ca

Phone: 587-984-8456

EDUCATION

University of Alberta

Edmonton, AB (2017–Now)

- MSc. Optimal Control and Data Analytics
- GPA: 3.93 / 4.00

University of Alberta

Edmonton, AB (2012–2017)

- BSc. Chemical Engineering Co-op Program with Distinction
- GPA: 3.85 / 4.00

WORK EXPERIENCE

University of Alberta

Department of Chemical and Materials Engineering - Process Control Group Edmonton, AB (Sept 2017 - Now)

- Currently comparing Model Predictive Controls (MPC) using collocation trajectory optimization against Deep Deterministic Policy Gradient (DDPG) reinforcement learning methods on multiple-input multiple-output (MIMO) continuous states, continuous action systems using Python
- Developed reinforcement learning Python script to find optimal set points for various manufacturing processes
- Developed *off-policy* Q-learning adaptive controller for an industry scale water treatment plant, resulting in significant electricity savings, while meeting strict gov't regulations
- Developed SMART industrial alarm system with alarm prioritization and redundant alarm removal via reinforcement learning, pattern recognition and data mining algorithms
- Knowledge and experience in building supervised, unsupervised, and reinforcement learning models using Python packages such as TensorFlow, scikit-learn, NumPy, SciPy, and Matplotlib
- Presented ideas for optimal control using reinforcement learning to research sponsors: Suncor, Emerson, Spartan Controls, etc.

Canadian Natural Resources Limited - Horizon Project

Data Scientist / Optimization Co-op Student Calgary, AB (May 2016 - Dec 2016)

- Coded aesthetically pleasing and intuitive data analyzation interfact using Microsoft Excel VBA and Tableau. Allowed team to make 10M+ decisions regarding future strategic development
- Modelled and analyzed results for future oil sands mining plans in ARENA software
- Involved in the controls design of the new oil sands mining project

ARC Resources Ltd.

Data Scientist (Exploitation) Co-op Student Calgary, AB (Jan 2015 - Aug 2015)

- Created a beautiful Spotfire GUI for a large oil and gas field in Northern Alberta; allowed creation of custom visualizations for 80+ different variables and included an interactive map
- Created automatic Excel spreadsheet with data dump capable of processing over 10 million cells of data; Spreadsheet contained over 80 variables for over 400 oil wells
- Built oil & gas reserves map for a large oil and gas field in Northern Alberta using Microsoft Excel and presented potential large reservoirs to the team
- Explored innovative well designs by analyzing over 9 million cells of data with 80+ features

University of Alberta - Partnered with Alberta Health Services

Bioinformatics Research Assistant Edmonton, AB (May 2014 - Aug 2014)

- Performed raw data processing via outlier removal, feature scaling and feature engineering
- Maintained and improved toxicity assessment MATLAB analyzation codes used for principle component analysis, hierarchical k-means / k-medoids clustering, and drug effect classification
- Applied various classification algorithms to classify drugs' impact on humans and to explore correlation between in vivo and in vitro experimentation
- Aided in improving the scalability of the MATLAB GUI responsible for feature extraction
- Helped write various research papers and reports for the results of the project.

ORGANIZATION AND CLUB ACTIVITIES

Department of Chemical and Materials Engineering - Graduate Students' Association

VP - Finance

Edmonton, AB (Sept 2018 - Now)

- Manage the 2018 - 2019 fiscal year budget for the Chemical and Materials Engineering GSA
- Ensure all academic and recreational events hosted by GSA are within budget compared to previous years
- Responsible for raising operating funds via fund-raiser events or through application of grants

University of Alberta - Faculty of Engineering

Faculty Leader

Edmonton, AB (April 2018 - Now)

- Responsible for leading a group of 25 new undergraduate students throughout campus for 2 days
- Created a friendly, neutral environment where new students are comfortable, motivated, and excited
- Worked tirelessly
- Ensure undergraduate students are equipped with reliable, truthful and useful information for their upcoming University journey

University of Alberta - Faculty of Engineering

Teaching Assistant - Ch E 358 Process Data Analysis

Edmonton, AB (Sept 2018 - Now)

- Responsible for teaching a class of undergraduate students introductory statistics and machine learning
- Created videos and other interactive tutorials to enhance learning experience
- Related concepts in class to real world problems to bridge the gap between the classroom and the real world

GitHub

Personal Project

Edmonton, AB (Sept 2017 - Now)

- Built different dynamic SISO, MISO, SIMO, and MIMO simulators to evaluate various control strategies and their characteristics.
- Compared performance of Proportional-Integral-Derivative, model predictive control and reinforcement learning controllers on different dynamic simulations to evaluate the best controllers for different situations.

ADDITIONAL CERTIFICATES AND INFORMATION

Deeplearning.ai

Online (2018)

- Deep Learning Specialization
- Developed knowledge in deep feedforward neural networks, RNNs with LSTM/GRU, and CNNs
- Learned about the optimization methods of deep learning and effective hyper parameter tuning

Udemy

Online (2018)

- Tensorflow for Deep Learning
- Learned application skills for Tensorflow using Jupyter notebook
- Built feedforward neural networks, RNNs with LSTM/GRU and CNNs

Medium / StackOverflow

Online (2017 - Now)

- Active contributor in the Stack Exchange / Stack Overflow community, answering questions on the public forums regarding supervised, unsupervised, and reinforcement learning concepts and application
- Actively blogging concepts in data science, artificial intelligence and advanced controls

Technical Skills Python, MATLAB, Tableau, TIBCO Spotfire, Microsoft Word, Microsoft PowerPoint, Microsoft Excel
Microsoft VBA, Linux/iOS/Windows Operating Systems, Jupyter Notebook, L^AT_EX

Languages Fluent in English and Mandarin

External Links [StackOverflow](#) [Medium](#) [LinkedIn](#)