Jesse WARD-BOND
Process Engineer | Biochemist

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- Toronto, Ontario, Canada
- Volleyball, Trivia, Fantasy/Sci-fi, Extremely Spicy Food

SKILLS

Programming	Python (Matplotlib, PyTorch), C, Java, R (ggplot, dplyr), Javascript (React, Node.js), HTML5, CSS, LaTeX
Software/Tools	Gurobi, PyTorch, COMSOL, Git, Jupyter, Anaconda, R Suite, Arduino, UniSym
Languages	English (fluent), Mandarin (int.), French (beg.), Korean (beg.)

EDUCATION

2021 - Present **MASc in Mechanical and Industrial Engineering**
University of Toronto
Co-supervised by Dr. Timothy Chan and Dr. Edmond Young. Investigating machine learning techniques to optimize the design of inertial cell-separators. Courses included: Machine Learning for Optimization, Linear/Integer Programming, Organ-On-A-Chip Engineering.

2012-2018 **BASc Chemical Engineering & BSc Honours Biochemistry**
University of Ottawa
A six-year (with co-op), 62-course, double major covering the entirety of both the Chemical Engineering and Biochemistry curriculums. Completed in April 2018 Magna Cum Laude (**CGPA 8.8/10**). Courses included: Calculus I-III, Linear Algebra, ODEs, Numerical Methods, Physics, Transport Phenomena, Java, C, VBA, etc.

PROJECTS

METRO-MAPS   2022-PRESENT
github.com/jwardbond/metro-maps
Currently developing a python-based implementation of the algorithm presented in Nollenburg & Wolff's *Drawing and Labelling High-Quality Metro Maps by Mixed-Integer Programming*. Ultimate goal is to implement cut-generation strategies to reduce solution time.

`Python` `Gurobi` `Mixed-Integer Programming`

ALWAYS-LEARN   2020-PRESENT
github.com/jwardbond/jwardbond.github.io
A personal website built using 'minimal mistakes' in Jekyll/Ruby.

`HTML` `SCSS` `Javascript` `Ruby` `Jekyll`

SportsSchedulingRLGNN   2021
github.com/jamalc19/SportsSchedulingRLGNN
Developed a reinforcement learning model + graph neural network model to solve double-round-robin tournament scheduling problems. Tuned hyperparameters, and compared results to a *de novo* heuristic algorithm.

`Python` `PyTorch`

FUEL FOR FAT LOSS   2018-2021
https://fuelforfatloss.com/
Manged and built a landing page, website, membership portal, and marketing materials for the creator of the Fuel for Fat Loss program - a west-coast based online nutrition/fitness/lifestyle coaching program used by hundreds of clients. Developed in Squarespace with customized HTML/CSS/JS for differentiation.

`HTML` `CSS` `JS` `Instakart` `Squarespace`

HDI-TABLE-SCRAPER   2019
github.com/jwardbond/HDI-table-scraper
Built a web scraper in R to pull course data from HDI's online course calendar. Currently used by HDI partner Radar Solutions Group to build custom course calendars.

`R` `magrittr` `rvest` `xml2`

AVOCADO-DATA-EXPLORATIONS   2018
github.com/jwardbond/avocado-data-explorations
A practice project in R to familiarize myself with some common graphing packages, regex, and set operations. Wrote scripts to clean-up, display, and explore a dataset from The Hass Avocado Board.

`R` `ggplot` `maps`

🧰 PROFESSIONAL EXPERIENCE

September 2021
Present

Teaching Assistant - University of Toronto
Toronto, Canada
> Lead weekly 2-hour seminars of 20+ engineering students
> Designed activities and facilitated discussions on how engineering relates to the climate crises, the distribution of wealth/resources, and information security
> Created lesson plans and presentations from course material
> Managed groups, grades, and course material on Quercus

Leading Seminars Quercus Preparing activities Marking

May 2021
October 2018

Application Engineer - Spartan Controls
Vancouver, Canada
> Responsible for CAD 1.5 million per year in sales of process-control equipment
> Developed and maintained relationships with key customer accounts to drive business
> Hosted instructional seminars for 50+ customers to educate and build product loyalty
> Worked in a team to customize products and sales strategies for different customer bases.

Fisher Valve Sizing Engineering Sales R VBA SAP P&IDs

March 2018
December 2018

Research Assistant, Surface Plasmon Photonics - Berini Lab - University of Ottawa
Ottawa, Canada
> Designed and implemented experimental protocols to solve a critical problem in SPR biosensors
> Performed digital image analysis of Fluorescence microscopy results with ImageJ, and analyzed/reported results with R.
> See publication section, "*Non-specific adsorption...*"

Fluorescence Microscopy ImageJ R Python

May 2016
January 2016

Research Assistant, Organic Photocatalysis - Jiang Lab - Tianjin University
Tianjin, China
> Studied Mandarin Chinese to help communicate complex topics across a language barrier
> Rapidly familiarized myself with the fabrication and electronic properties of organic semiconductors for photocatalysis
> See publication section, "*g-C3N4@ α-Fe2O3...*"

FTIR XRD XPS SEM

May 2017
September 2016

Research Lead, Solid-Associated Oil-Sand Proteins - Altosaar Lab - University of Ottawa
Ottawa, Canada
> Developed and lead a project investigating proteins trapped in oil sands in order to develop novel bio-remediation and tertiary recovery techniques
> Pitched my project to international investors and a panel of judges

Lit. Reviews HPLC-MS BCA Assays Poster presentations

May 2016
January 2016

R&D Employee - Wells Bio
Seoul, South Korea
> Developed rapid diagnostic tests for Zika, Dengue, etc.
> Organized and hosted a weekly language exchange

qPCR SDS-PAGE Lateral Flow Immunoassays

PUBLICATIONS & MAJOR WORKS

Rashid, S., **Ward-Bond, J.**, Krupin, O., Berini, P. 2020. *Non-specific adsorption of protein to microfluidic materials*. Manuscript Submitted for Publication.

Wu, Y., **Ward-Bond, J.**, Li, D., Zhang, S., Shi, J. and Jiang, Z. 2018. g-C3N4@ α-Fe2O3/C Photocatalysts: Synergistically Intensified Charge Generation and Charge Transfer for NADH Regeneration. *ACS Catalysis,8(7)*, pp.5664-5674.

Ward-Bond, J., Altosaar, I. 2018. Solid-Associated Proteins in the Athabasca Oil Sands – Undergraduate Thesis. *University of Ottawa*.

Ward-Bond, J., Colin, J., Yelle, N. 2015. Anesthetic Hypodermic Needle Cover – Patent Application No. 14975267 – Lapsed. *USPTO*

AWARDS

2022	**Canadian Graduate Scholarship - Master's (NSERC)** - *University of Toronto*
2021	**Ontario Graduate Scholarship** - *Declined - University of Toronto*
2021	**Vector Scholarship in Artificial Intelligence** - *Vector Institute*
2021	**Queen Elizabeth II Scholarship** - *University of Toronto*
2012-2018	**Dean's List** - *University of Ottawa*
2012-2018	**Admissions Scholarship** - *University of Ottawa*
2018	**Finalist** - *Professional Engineers Ontario Water Purifier Competition*
2018	**Most Innovative** - *University of Ottawa Senior Engineering Design Competition*
2017	**1st Place** - *University of Ottawa Startup Weekend*
2017	**Best Poster Presentation** - *University of Ottawa Biochemistry Poster Competition*

AFFILIATIONS AND MEMBERSHIPS

2022-Present University of Toronto Fiction Book Club

2021-Present University of Toronto Nonfiction Book Club

2021-Present University of Toronto Academic Trivia Club

2018-2021 Engineers and Geoscientists BC Outreach
Volunteered to present to classes of children (gr. 6-8) and to lead them in hands-on activities to introduce them to Chemical Engineering.

2010-2020 Volleyball coach
Taught indoor and beach volleyball to both children and adults for several different organizations. Experience levels ranged from absolute beginner to advanced.