Martin Ondrus

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Scientist developing statistical and machine learning methods for neuroimaging

Education

Sep. 2024 –	**Doctor of Medicine, (MD)**
	Faculty of Medicine and Dentistry, University of Alberta
Jan. 2021 –	**Doctor of Philosophy, (PhD)**
	Neuroscience and Mental Health Institute, University of Alberta
	Computational Neuroscience
	Advisor: Dr. Ivor Cribben, Committee: Dr. Russ Greiner, Dr. Bo Cao
2018 – 2020	**Bachelor's of Commerce, After Degree**
	Alberta School of Business, University of Alberta
	Operations Management Major
	GPA: 3.97
2014 – 2018	**Bachelor's of Science**
	Faculty of Science, University of Alberta
	Biological Science Major, Economics Minor
	With Distinction, GPA: 3.73

Affiliations

Apr. 2023 –	**Alberta Machine Intelligence Institute (Amii)**
	Early Career Accelerator Program
Apr. 2023 –	**Department of Biostatistics, New York University (NYU)**
	Visiting Research Scientist
Jan. 2021 –	**Neuroscience and Mental Health Institute (NMHI), University of Alberta**
	Research Scientist

Work Experience

Northwest Auto Group | Sep. 2021 – Mar. 2023
Data Engineer Intern, Sales and Service

- Created a recurrently updating dashboard for Western Canada's largest automotive dealership group to empower executives and marketing departments towards data-informed decision making in their advertising strategy
- Designed and developed a SQL, Python, and Google Cloud based data transformation and visualization pipeline for over 60,000 semi-structured data points which unified key customer information across 4 different databases
- Presented final pipeline in an understandable manner to a non-technical audience, successfully on-boarded clients, and reduced process lead time by more than 50% resulting in 10+ hours saved during marketing campaigns
- Optimized back-end computations and delivered final data product at less than 10% of original budget

Volkswagen Canada | Jan. – Apr. 2020
Data Science Intern, National Dealers Advisory Council

- Led a team of 3 student data scientists in modelling 2022-2025 Canadian sales of Volkswagen's most important vehicle release in the past decade, the fully electric VW ID.4
- Built an intuitive Excel-based simulation tool and visualization interface using solver and VBA for back-end computations which optimized allocations to maximize profitability and product turnover of the launch
- Presented deliverable and forecasts to Volkswagen Canada senior leadership and advised on regional allocation of over 6,000 new and highly valuable ID.4 vehicles

Teaching Assistant | Jan. – Dec. 2019
MGTSC 312, Alberta School of Business

- Led students in hands-on statistical analysis exercises using Excel, covering topics such as simple and multiple linear regression, hypothesis testing, dummy variable encoding, and feature selection
- Communicated complex concepts clearly and concisely to approximately 80 students in weekly lab lectures, ensuring effective understanding and engagement
- Facilitated student success by clarifying complex concepts, promptly addressing inquiries, and maintaining up-to-date knowledge of course material

Publications

1. (Manuscript in Preparation) **M. Ondrus**, et al. Towards Modelling Complex, Interdependent Systems: A Latent Multilayer Graphical Model, 2024.

2. (Manuscript in Preparation) **M. Ondrus**, et al. SLICE: A direct method for the estimation of the sparse and latent variable components of a Gaussian graphical model, 2024.

3. (Manuscript in Preparation) **M. Ondrus**, et al. Early Mild Cognitive Impairment Classification using Dynamic, Multi-Scale Networks, 2023.

4. **M. Ondrus** and I. Cribben. fabisearch: A package for change point detection in and visualization of the network structure of multivariate high-dimensional time series in r. *Neurocomputing*, 578:127321, 2024

5. (Preprint) **M. Ondrus**, E. Olds, and I. Cribben. Factorized Binary Search: change point detection in the network structure of multivariate high-dimensional time series, 2021. arXiv:2103.06347 [stat.ME]

6. S. Hatami, C. W. White, X. Qi, M. Buchko, **M. Ondrus**, A. Kinnear, S. Himmat, C. Sergi, J. Nagendran, and D. H. Freed. Immunity and Stress Responses Are Induced during Ex Situ Heart Perfusion. *Circulation: Heart Failure*, 2020

7. S. Hatami, C. White, S. Shan, A. Haromy, X. Qi, **M. Ondrus**, A. Kinnear, S. Himmat, E. Michelakis, J. Nagendran, and D. Freed. Myocardial Functional Decline During Prolonged Ex Situ Heart Perfusion. *Annals of Thoracic Surgery*, 108(2), 2019

8. S. Hatami, C. W. White, **M. Ondrus**, X. Qi, M. Buchko, S. Himmat, L. Lin, K. Cameron, D. Nobes, H. J. Chung, J. Nagendran, and D. H. Freed. Normothermic ex situ heart perfusion in working mode: Assessment of cardiac function and metabolism. *Journal of Visualized Experiments*, 2019

Abstracts, Oral Presentations, and Posters

1. **M. Ondrus**, I. Cribben, Y. Feng. Revisiting latent variable Gaussian graphical models with applications in Neuroimaging. *Joint Statistical Meeting*, August 2024

2. **M. Ondrus**, and I. Cribben. Change point detection of high-dimensional graphs for early MCI classification in fMRI. *Organization for Human Brain Mapping*, June 2024

3. **M. Ondrus**, and I. Cribben. Early Mild Cognitive Impairment Classification using Dynamic, Multi-Scale Networks. *Upper Bound, Alberta Machine Intelligence Institute*, May 2023

4. **M. Ondrus**, E. Olds, and I. Cribben. Factorized Binary Search: change point detection in the network structure of multivariate high-dimensional time series. *Neuroscience Research Day, University of Alberta*, Mar. 2022

5. **M. Ondrus**, E. Olds, and I. Cribben. FaBiSearch: A new statistical method for understanding brain dynamics through networks. *University of Alberta's Inaugural Digital Innovation Showcase*, May 2021

6. X. Qi, S. Hatami, C. White, S. Himmat, N. Aboelnazer, **M. Ondrus**, Y. Wu, A. Kinnear, J. Nagendran, and D. Freed. Inflammation and innate immune activation during ex vivo heart perfusion. *The Journal of Heart and Lung Transplantation*, 37(4):S220, Apr. 2018

7. **M. Ondrus**, S. Hatami, and D. Freed. Functional Decline of the Ex Vivo Perfused Heart is Not Due to Cell Death. *50th Annual Summer Students' Research Day, Faculty of Medicine and Dentistry, University of Alberta*, Nov. 2017

8. **M. Ondrus**, S. Hatami, and D. Freed. Seeking the optimal EVHP protocol: Does the work matter? *49th Annual Summer Students' Research Day, Faculty of Medicine and Dentistry, University of Alberta*, Oct. 2016

Software

1. `fabisearch: Change Point Detection in High-Dimensional Time Series Networks` `https://cran.r-project.org/package=fabisearch`

Scholarships and Awards

2024	J Gordin Kaplan Graduate Student Scholarship ($2,000)
2023	Alberta Graduate Excellence Scholarship ($12,000)
2022	Michael Smith Foreign Study Supplements ($6,000)
2021	Alberta Innovates Graduate Student Scholarship (AI GSS) ($1,000/month)
2021	Natural Sciences and Engineering Research Council of Canada (NSERC) Canada Graduate Scholarships – Master's (CGS M) ($17,500)
2021	Walter H Johns Graduate Fellowship ($5,800)
2021	Richard B. Stein Neuroscience Graduate Studentship ($4,000)
2019	Peter Lougheed Scholarship ($10,000)
2017/18/19	Jason Lang Scholarship ($1,000)
2018	University of Alberta Alumni Advantage Scholarship ($2,500)
2016/17/18	University of Alberta Academic Excellence Scholarship ($2,000/$1,500/$2,000)
2017	Alberta Transplant Institute (ATI) Undergraduate Summer Studentship Award ($1,500/month)
2017	Summer Students' Research Day Poster Presentation Award ($300)
2016	Motyl Endowment Cardiac Sciences Summer Studentship ($1,300/month)
2014	Alexander Rutherford Scholarship ($2,500)
2014	University of Alberta Entrance Scholarship ($1,000)

Technical Skills

Programming: Python (*pandas, numpy, matplotlib, seaborn, scikit-learn, pytorch*), R (*tidyverse, ggplot2, caret, e1071, randomForest, glmnet, parallel*), SQL, Matlab
Quantitative: Data wrangling & pre-processing, visualization, database querying, experimental design, statistical inference and hypothesis testing, algorithm design, optimization, machine learning and prediction

Other: Jupyter/Jupyter Notebook, Markdown, LaTeX, Git/Github, Distributed Computing, Unix Shell, SLURM