DAVID LANDSMAN

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- Extensive theoretical and applied knowledge in machine learning for natural language processing, controllable text generation and graph-based data analysis
- Experience in software development, algorithm design, continuous integration and delivery
- Interested in developing private and secure machine learning algorithms using differential privacy and cryptography
- Interested in developing novel algorithms for representation learning on unstructured data

EDUCATION

MSc in Applied Computing **September 2020 – December 2021**
University of Toronto, Department of Computer Science
Cumulative GPA: 4.0/4.0
Notable Courses: Algorithms for Private Data Analysis; Introduction to Computational Linguistics; Natural Language Computing; Computer Security

Honours BSc in Computer Science **September 2015 – April 2019**
University of Toronto, Faculty of Arts and Science
Cumulative GPA: 3.86/4.0
Minors in **Statistics** and **Mathematics**
Notable Courses: Fundamentals of Cryptography; Probabilistic Learning and Reasoning; Database Systems Technology

WORK EXPERIENCE

Vanguard, Toronto ON May 2021 to December 2021
Research Scientist Intern, AI Research

- Researched state-of-the-art approaches in controllable text generation (PPLM, Prefix-Tuning, Tag-and-Generate), and analyzed strengths and shortcomings
- Developed a novel extension of beam search to allow for robust, controllable text generation, outperforming PPLM baseline
- Authored a research report detailing the novel approach for controllable generation with experiments on public datasets
- Presented approach and findings at enterprise-wide, multidisciplinary event

Vector Institute, Toronto ON September 2020 to May 2021
Academic Partnerships Intern

- Developed a robust and flexible algorithm using Scrapy for scraping job postings from partner websites
- Created automation tools in GitHub Actions for extracting and uploading job postings to the Vector Talent Hub
- Wrote documentation for easily integrating new partner websites into scraping tool

Center for Urban Science and Progress, New York University
Brooklyn, NY October 2019 to August 2020
Research Affiliate

- Applied Combo and k-means clustering algorithms to urban commute and social activity networks
- Analyzed regional socio-economic outcomes based on cluster structures
- Investigated representation learning approaches (e.g., graph2vec) in complex networks
- Evaluated feature mappings of complex networks
- Presented papers at two conferences (YSC, HICSS)

MAP Centre for Urban Health Solutions, St. Michael's Hospital
Toronto ON October 2019 to August 2020
Research Coordinator

- Developed regex rulesets for extracting clinical variables from electronic health records
- Created clinical database for tuberculosis patients from electronic health records
- Wrote automation scripts using GitHub Actions for scraping and aggregating COVID-19 regional and provincial data
- Built R shiny application for COVID-19 GTA surge planning model
- Analyzed heterogeneity in prevalence and testing of COVID-19 across different outbreak settings
- Authored and collaborated on 4 research papers, including first authorship paper detailing NLP approach to create a clinical database for tuberculosis research

MAP Centre for Urban Health Solutions, St. Michael's Hospital
Toronto ON May 2018 to August 2019
Research Affiliate

- Investigated linear programming and network flow approaches to clinician scheduling
- Implemented a linear programming formulation in Python to solve scheduling problem
- Developed a scheduling application with a clean and intuitive user interface using Qt5
- Authored a research paper detailing linear programming approach to scheduling

CIBC, Toronto ON May 2017 to August 2017
Intermediate Application Developer

- Collaborated with backend and frontend engineers and business analysts
- Contributed to architectural design and user interface of new application using AngularJS and KendoUI
- Migrated data from decommissioned database
- Rewrote C# API for downstream applications

TEACHING EXPERIENCE

University of Toronto, Toronto ON September 2020 to December 2020
Teaching Assistant, Department of Computer Science
Foundations of Computer Science

- Marked and provided feedback to students on assignments, tests, and final project
- Provided answers and clarifications to students during lectures
- Held office hours to assist first year CS students with assignments and lecture content

PUBLICATIONS

Journal Publications

D. Landsman, A. Abdelbasit, C. Wang, M. Guerzhoy, U. Joshi, S. Mathew, C. Pou-Prom, D. Dai, V. Pequegnat, J. Murray, K. Chokar, M. Banning, M. Mamdani, S. Mishra, and J. Batt. "Cohort Profile: St. Michael's Hospital Tuberculosis Database (SMH-TB), a Retrospective Cohort of Electronic Health Record Data and Variables Extracted Using Natural Language Processing." PloS One 16, no. 3 (2021).

L. Wang, H. Ma, K. C. Y. Yiu, A. Calzavara, **D. Landsman**, L. Luong, A. K. Chan, R. Kustra, J. C. Kwong, M.-C. Boily, S. Hwang, S. Straus, S. Baral, and S. Mishra. "Heterogeneity in risk, testing and outcome of COVID-19 across outbreak settings in the Greater Toronto Area, Canada: an observational study". CMAJ Open 8, no. 4 (2020).

S. Mishra, L. Wang, H. Ma, K. C. Yiu, J. M. Paterson, E. Kim, M. J. Schull, V. Pequegnat, A. Lee, L. Ishiguro, E. Coomes, A. Chan, M. Downing, **D. Landsman**, S. Straus, and M. Muller. "Estimated surge in hospitalization and intensive care due to the novel coronavirus pandemic in the Greater Toronto Area, Canada: a mathematical modeling study with application at two local area hospitals". CMAJ Open 8, no. 3 (2020).

V. Landsman, **D. Landsman**, C. S. Li, and H. Bang. "Overdispersion models for correlated multinomial data: Applications to blinding assessment". Statistics in Medicine 38.25 (2019).

Conference Papers

D. Landsman, P. Kats, A. Nenko, S. Kudinov, and S. Sobolevsky. "Social Activity Networks Shaping St. Petersburg". In: Proceedings of the 54th Hawaii International Conference on Systems Science. 2021.

D. Landsman, P. Kats, A. Nenko, and S. Sobolevsky. "Zoning of St. Petersburg Through the Prism of Social Activity Networks." Procedia Computer Science, 9th

International Young Scientists Conference in Computational Science, YSC2020, (2020).

Preprints

Mishra, Sharmistha, Huiting Ma, Gary Moloney, Kristy CY Yiu, Dariya Darvin, **David Landsman**, Jeff Kwong, et al. "Increasing Concentration of COVID-19 by Socioeconomic Determinants and Geography in Toronto, Canada: An Observational Study." Preprint: https://www.medrxiv.org/content/10.1101/2021.04.01.21254585v1. 2021.

D. Landsman, H. Ma, J. Knight, K. Gough, and S. Mishra. "A flexible integer linear programming formulation for scheduling clinician on-call service in hospitals". Preprint: http://arxiv.org/abs/1910.08526. 2019.

TECHNICAL SKILLS

Analytical Skills: Algorithm Design, Optimization, Data Analysis and Statistics

Programming: Python, R, C/C++, C#, Java, JavaScript, SQL

Packages & Frameworks: pytorch, tensorflow, transformers, scrapy, (geo)pandas, networkx, scikit-learn, dplyr, plotly

Tools: Git (GitHub, BitBucket), CI/CD (GitHub Actions, Travis CI, AppVeyor), Jira

HONORS AND AWARDS

Vector Scholarship in Artificial Intelligence, Vector Institute 2020-21

Innis College Exceptional Achievement Award, University of Toronto 2017-18

Innis College Anniversary Scholarship Award, University of Toronto 2016

President's Entrance Scholarship, University of Toronto 2015