

EDUCATION

M.Sc., Applied Mathematics – Simon Fraser University

Sep 2020-Mar 2023

- Thesis title: *Unrolled NESTA: constructing stable, accurate and efficient neural networks for gradient-sparse imaging problems*
- Contributes towards research in: deep neural networks for inverse problems in imaging and optimization acceleration schemes for fast image reconstruction
- Committee: Ben Adcock, Nilima Nigam, Ozgur Yilmaz, Nadish de Silva

B.Sc., Mathematics Honours – Simon Fraser University

Sep 2014-Apr 2020

- Minor in *Computing Science*

TECHNICAL SKILLS

- Linux, Windows
- Microsoft Office 365, LaTeX
- Python, MATLAB, SQL, C, Git, Bash
- tensorflow, torch, numpy, pandas, spark, scikit-learn, networkx, jupyter
- Machine learning and statistics
- Data modelling, data analysis, data visualization and data cleaning
- Optimization theory and algorithms
- Technical writing, presentations and research

WORK EXPERIENCE

Data scientist – Statistics Canada

Oct 2019-Aug 2020

- Designed and implemented OpenTabulate, a data tabulation Python program
- Assembled and published open datasets for Canadian health and education facilities on Statistics Canada's website
- Collaborated with co-workers and supervisors to write, edit, and submit documentation of several projects

Jan-Apr 2019

May-Aug 2018

PUBLICATIONS

Journal papers

- M. Neyra-Nesterenko & B. Adcock, *NESTANets: stable, accurate and efficient neural networks for analysis-sparse inverse problems*. *Sampl. Theory Signal Process. Data Anal.* **21**, 4 (2023)

Conference abstracts

- B. Adcock & M. Neyra-Nesterenko. Provably accurate, stable and efficient deep neural networks for compressive imaging. In *International Conference on Computational Harmonic Analysis*, volume 48. 13-17 Sep 2021.

Preprints

- B. Adcock, M. Colbrook & M. Neyra-Nesterenko, *Restarts subject to approximate sharpness: a parameter-free and optimal scheme for first-order methods*. arXiv:2301.02268.

PRESENTATIONS

Contributed talks

- *Unrolled NESTA: constructing stable, accurate and efficient neural networks for gradient-sparse imaging problems* – Math Grad Social Seminar (Feb 7, 2023)
- *Restart schemes: a powerful parameter-free acceleration scheme for first-order methods*
SFU Applied Math Seminar (Nov 23, 2022)
- *Stable, accurate and efficient deep neural networks for reconstruction of gradient-sparse images*
SIAM Pacific Northwest Conference (May 21, 2022)
- *Stable, accurate and efficient deep neural networks for gradient sparse imaging*
SIAM Conference on Imaging Science (Mar 22, 2022)
- *Stable, accurate and efficient deep neural networks for inverse problems with analysis sparse models*
SFU Operations Research Seminars (Feb 14, 2022)
- *Provably accurate, stable and efficient deep neural networks for compressive imaging*
International Conference on Computational Harmonic Analysis (Sep 17, 2021)
- *Provably accurate and stable deep neural networks for imaging*
CAIMS Annual Meeting (Jun 23, 2021)

RESEARCH INTERNSHIPS

Undergraduate Research Assistant – Simon Fraser University

- Supervised by Paul Tupper and funded by NSERC May-Aug 2017
- Supervised by Karen Yeats and funded by SFU May-Aug 2016

AWARDS

NSERC Canada Graduate Scholarships Master's

May 2021-Apr 2022

Value: \$17500, received from NSERC by application

Peter Borwein Memorial Graduate Scholarship

Jan-Apr 2022

Value: \$1500, received from SFU by nomination

BC Graduate Scholarship

Sep 2020-Aug 2021

Value: \$15000, received from SFU by nomination

NSERC Undergraduate Student Research Award

May-Aug 2017

Value: \$4500, received from NSERC by application

VPR Undergraduate Student Research Award

May-Aug 2016

Value: \$4500, received from SFU by application

RECOGNITION

- AISTATS 2023 top reviewer (top-10% of reviewers) Feb 2023

REFeree ACTIVITY

- SIAM Journal on Scientific Computing (SISC) Spring 2023
- International Conference on Artificial Intelligence and Statistics (AISTATS) Fall 2022

WORKSHOPS and DEVELOPMENT

PIMS-IFDS-NSF Summer School on Optimal Transport – University of WA Jun 20-Jul 1, 2022

- Workshop and lectures on optimal transport, with numerous researchers presenting their work in the area

PIMS Math to power Industry workshop – University of Calgary Aug 3-27, 2021

- Completed MITACS professional industry training and development courses
- Presented and reported for Serious Labs project on developing real-time simulation for hydraulic systems

TEACHING and MENTORSHIP

Teaching assistant – Simon Fraser University

- Advised and guided students in math workshop and tutorials
- Performed marking, invigilation, and management duties
- Past courses and workshops:
 - Continuous optimization, algebra workshop Fall 2022
 - Ordinary differential equations Summer 2022
 - Algebra workshop, mathematics of data science Spring 2022
 - Vector calculus, applied calculus workshop Spring 2021
 - Algebra workshop Fall 2020
 - Applied calculus workshop Fall & Spring 2018

PERSONAL PROJECTS

Address parsing with recurrent neural networks Jun 26, 2023

- Mockup character-level Canadian address parser built with machine learning
- Procedural generation used to tackle the issue of imbalanced data
- Improved robustness by augmenting training data with typos

San Francisco fire service analysis May 23, 2023

- Independent exploration of San Francisco's fire department with open data
- Collected descriptive statistics on service calls, safety complaints and incidents
- Examined trends and answered questions using inferential statistics

Strongly solving Quantik Mar 22, 2023

- Independently solved the 2-player abstract strategy game Quantik
- Search written in C for high performance with cache-friendly data structures

MEMBERSHIPS

Canadian Applied and Industrial Mathematics Society (CAIMS)

Jan 2021-Dec 2022

Society for Industrial and Applied Mathematics (SIAM)

Jan 2021-Dec 2022

LICENSES and CERTIFICATIONS

First aid and CPR/AED level C – Canadian Red Cross

Jul 2023-Jul 2026

- Credential ID: 104291530