CHRISTOPHER WEST

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PROFESSIONAL SUMMARY

Recent graduate and dual citizen with 5+ years of experience in machine learning, computer vision, data science, and medical imaging research. Currently employed as a Data Scientist with Canadian Nuclear Labs.

EDUCATION

Master of Computer Science, University of Waterloo 2021 - 2023
Research: *Parameterizing the Spatial Distribution of Renal Tumors using Modified Spherical Coordinates*
Relevant Coursework: Computer Vision, Reinforcement Learning, Optimization, Health Informatics.

Bachelor of Computer Science, Honours, University of British Columbia 2017 - 2021
Research: *Federated Data-Integration of Image Data through Heuristics-Based Automated Preprocessing*
Relevant Coursework: Machine Learning, Algorithms, Bioinformatics, Relational Databases.

SKILLS

Technical Python, SQL, Numpy, Pandas, Scipy, Keras, Tensorflow, PyTorch, OpenCV, Git, Jupyter, C, Linux, Tableau
Soft Team Leadership, Technical Writing, Project Management, Presentations, Public Speaking

EXPERIENCE

AI/ML and Imaging Research Assistant Sept 2021 - Sept 2023
University of Waterloo Cheriton School of Computer Science *Waterloo, ON*

- Developed a novel method to parameterize kidney tumor location based on spherical coordinate projections through the use of convex hulls, level sets, and nearest neighbor methods
- Optimized and benchmarked deep learning pipelines with Tensorboard, TFRecords, data sharding and TPUs
- Modeled few-shot transfer learning methods and SimCLR contrastive learning in segmentation tasks
- Performed exploratory data analysis on the relationship between tabular and imaging data in kidney cancer outcomes
- Led a team to identify 2021 Canadian census vulnerabilities using constrained programming and SMT solvers

AI/ML Privacy Researcher May 2020 - July 2020
University of British Columbia Data Science Institute *Vancouver, BC*

- Updated and refactored privacy-preserving GAN synthetic data generation framework to TensorFlow 2.0 on Azure
- Experimented with novel federated heuristic privacy frameworks in the medical domain based on differential privacy
- Coauthor with Microsoft researchers, featured in the press here

AI/ML Multimedia Researcher May 2019 - Aug 2019
University of Alberta Computing Science Department *Edmonton, AB*

- Collaborated with medical professionals to develop practical AI-based applications for spinal cord injury rehabilitation
- Created extensive OpenCV preprocessing pipeline to process pressure-mat raw data
- Adapted existing deep-learning pose prediction model "AlphaPose" to the pressure imaging modality

AI/ML Multimedia Researcher May 2018 - Aug 2018
University of Alberta Computing Science Department *Edmonton, AB*

- Trained convolutional neural networks frameworks for segmentation on 3D structural MRI data
- Experimented with 2D, 3D and recurrent architectures to maximize classification accuracy in diseased vs healthy cohorts
- Created a novel sensitivity metric based on sliding windows and occlusion masks
- Found new biomarkers in brain MRI to diagnose early-onset Parkinson's degeneration

AI/ML Software Development Intern July 2016 - Aug 2016
University of Alberta Computing Science Department *Edmonton, AB*

- Used simple machine-learning and NLP techniques to correlate bag-of-words text representation with message sentiment
- Co-developed android application to locally run machine learning model on a smartphone
- Released Sentiment Keyboard, an app for detecting and preventing cyberbullying using simple NLP sentiment analysis and AI. Featured in the local news here, here and here

PUBLICATIONS

[Preprint] C. West, I. Vecna, and R. Chowdhury, "Random (Un)rounding: Vulnerabilities in Discrete Attribute Disclosure in the 2021 Canadian Census." arXiv, 2023. doi: 10.48550/ARXIV.2307.13859.

J.-F. Rajotte et al., "Reducing bias and increasing utility by federated generative modeling of medical images using a centralized adversary," Proceedings of the Conference on Information Technology for Social Good. ACM, Sep. 09, 2021. doi: 10.1145/3462203.3475875.

C. West, S. Soltaninejad, and I. Cheng, "Assessing the Capability of Deep-Learning Models in Parkinson's Disease Diagnosis," Lecture Notes in Computer Science. Springer International Publishing, pp. 237–247, 2020. doi: 10.1007/978-3-030-54407-2_20.

CHAPTERS AND BOOK REVIEWS

Transformers for Natural Language Processing, 2nd Edition, Full Book Review, SIAM, vol. 65, no. 1. Society for Industrial & Applied Mathematics (SIAM), pp. 319–328, Feb. 2023. doi: 10.1137/23n97565x.

Control Applications for Biomedical Engineering Systems, Chapters 7 & 8 Review, SIAM, vol. 64, no. 4. Society for Industrial & Applied Mathematics (SIAM), pp. 1083–1095, Nov. 2022. doi: 10.1137/22n975597.

PRESENTATIONS AND WORKSHOPS

Deconstructing Sex Differences in Single Neuron Electrical Activity, Workshop: Sex Differences in Physiology: Mathematical Modelling and Analysis, Banff International Research Station, Mar 2023

Multimedia in Medicine Chair, International Conference on Smart Multimedia, San Diego, Dec 2019

Assessing the Capability of Deep-Learning Models in Parkinson's Disease Diagnosis, International Conference on Smart Multimedia, San Diego, Dec 2019

Sentiment Keyboard, HIP Program Poster Session, University of Alberta, July 2016

PROJECTS

CantoTools: Minimalist tools to help language learners learn Cantonese

- Developed a C#-based pop-up dictionary reading application with persistent bookmark and word-status tracking. Integrates with words.hk Cantonese dictionary to provide definitions and frequency information.
- Released a Colab-powered application for scraping YouTube videos based on Cantonese word frequency information. Allows for multiple sorting fields for video recommendation as well as custom word-status imports.
- See repo here or on my website.

TEACHING

CS 231 - Algorithmic Problem Solving (Head Instructional Assistant)	Summer 2022, Summer 2023
CS 115 - Introduction to Computer Science 1 (Teaching Assistant)	Spring 2023
CS 135 - Designing Functional Programs (Teaching Assistant and Instructional Support)	Fall 2021, Spring 2022, Fall 2022

AWARDS

- University of Waterloo Math Domestic Graduate Student Award (High Standing) 2021, 2022
- University of Waterloo Graduate Scholarship 2021
- University of British Columbia Honours with Distinction in Computer Science 2021
- John Hopkins MedHacks 2019 Sponsored Competitor 2020
- AP National Scholar 2017
- University of Alberta Ross and Verna Tate Internship Award 2016