Chen (Charles) Zhao

Toronto, Canada ♦ 604-704-2751 ♦ czchen.zhao@mail.utoronto.ca ♦ Linkedin

Education

Bachelor of Science: Computing Science [Co-operative Education], Graduated in 12/2021
Simon Fraser University - Burnaby, Canada
Academic Accolades *Dean's Honour Roll Recipient [2018]*

Master of Engineering (MENG): Industrial Engineering, expected in 12/2023
University of Toronto - Toronto, Canada

Research and Professional Experience

Research Intern, 05/2023 to 08/2023
University Health Network– Toronto, Canada
- Developed and implemented attention-based neural networks to create embeddings for patient data, aligning it with prescription descriptions
- Automated and accurately classified protocol assignments based on patients' data and prescription standards
- Conducted in-depth analysis of dose value distributions, resulting in significant improvements in model performance

Research Student, 09/2022 to 08/2023
University of Toronto; SickKids Hospital – Toronto, Canada
- Utilized TF-IDF vectors with uni-gram analysis to process text from radiological reports, enabling the following MRI recommendation for patients
- Pre-trained RadBERT model on the SickKids radiological corpus and subsequently fine-tuned it to accurately classify pathology labels
- Conducted research on model explainability by employing attention-based attributions, identifying tokens with significant contributions for pathologies
- Collaborated with radiologists from SickKids, leveraging their domain-specific knowledge and expertise to explore further improvements in the research

Undergraduate Research Assistant, 05/2020 to 12/2020
Simon Fraser University – Burnaby, Canada
- Conducted extensive research on Bayesian Neural Network (BNN) and uncertainty measurement
- Modified the Stochastic Weight Averaging-Gaussian (SWAG) approach, developed deep ensemble models to enhance the accuracy of uncertainty prediction
- Calculated Expected Calibration Error (ECE) scores to quantitatively evaluate the calibration performance of the models

Machine Learning Operations Engineer (MLOps) Co-op, 09/2021 to 12/2021
Scotiabank – Toronto, Canada
- Managed and monitored operational processes for machine learning implementations and scheduler using Airflow and Docker.
- Deployed and tested new products on the MLOps platform, such as Fiddler, to detect occurrences of model drift and data drift
- Constructed dockerfile to update Spark version and synchronized configuration settings on Kubernetes, enabling efficient deployment

Data Engineer Co-op, 01/2021 to 04/2021
Insurance Corporation of British Columbia [ICBC] – North Vancouver, Canada
- Implemented Scala scripts to establish connections between JDBC databases and execute Oracle stored procedures on the Spark platform.
- Developed visually appealing dashboards using Tableau to effectively present data trends and insights to senior management and project teams
- Diligently investigated and resolved defects within programming codes, optimizing the efficiency of testing procedures

Automation Testing Engineer Co-op, 05/2020 to 12/2020
Insurance Corporation of British Columbia [ICBC] – North Vancouver, Canada
- Utilized technical proficiency in HiveSQL, OracleSQL, and DrillSQL to develop automated test scripts
- Modified test frames to adapt datasets into Oracle database, ensuring compatibility and efficiency
- Conducted automatic and manual regression testing procedures for each Tableau report update, ensuring accuracy and reliability of the reports

Academic Project Experience

Text-based SoftCLIP: Clip model softened using relaxed similarity 01/2023 to 04/2023
- Proposed the innovative approach of Text-based SoftCLIP, a unified multimodal model that utilizes text embedding similarities to achieve a soft cross-modal alignment, relaxing the strict one-to-one constraint between images and text.
- Extracted object classes from images and represented them as category sentences, generating a soft similarity matrix using BERT embeddings
- Achieved a testing accuracy of 75% for image and caption pairing on the COCO dataset, demonstrating the effectiveness of the proposed approach

Aladdin Recommender using Transformer, video link 09/2022 to 12/2022
- Developed a content-based recommendation system capable of accepting informal queries and suggesting top movies with high similarity.
- Implemented web-scraping scripts to crawl IMDB and Rotten Tomato movie information for the recommendation system.
- Designed model structures and fine-tuned a sentence-based transformer, incorporating a ContractiveOnlineLoss function to enhance performance
- Achieved an Mean Average Precision (mAP) of over 80% based on the returned movies with top similarities

Facial Identity Recognition with Masks, 01/2022 to 04/2022
- Developed a facial recognition system capable of classifying identities from facial images and videos even when faces are partially covered by masks.
- Collected and extracted images from video frames to create a comprehensive training and validation dataset using FaceNet.
- Initialized and trained a Deep Ensembled CNN model to accurately predict facial identities, incorporating variance evaluation techniques.
- Achieved an impressive accuracy of over 95% on the validation data and demonstrated precise performance on real-time video streams.

Skills

Programming Languages | Python, Scala, Java, C++, HTML, CSS, JavaScript, Ansible, SQL, LaTeX
Languages | Mandarin (Native) & English (Fluent)
Data Mining & Machine Learning Tools | Scikit Learn, PyTorch, Pandas, NumPy, Azure Synapse, Hugging Face, Spark & Hadoop
Resource Management Tools | Git, SVN, Jira & Jenkins