VARSHINI PRAKASH

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EDUCATION

M.Sc. in Computing Science — University of Alberta, Edmonton, Canada
Thesis Advisor: Osmar Zaiane — Expected: May 2024
GPA: 3.9/4.0

Bachelor of Technology in Computer Science — VIT University, Vellore, India
GPA: 9.26 / 10.0 — July 2020

PUBLICATIONS AND POSTERS

Prakash, V., Foster, A.L., Noble, J.& Zaiane, O. (2024). Integrating Conversational Pathways with a Chatbot Builder Platform. *Database and Expert Systems Applications*: 35th International Conference, DEXA'24 (Under Review)

Prakash, V., Chouinard, B., & Fyshe, A. (2023). Decoding Neural Representations of Sentences in Individuals with Autism. Poster presented at the Reverse Expo, University of Alberta.

Prakash, V., Moorthy, K., & Jose, J. T., (2020). Enhancing Predictability of Handwritten Document Content using HTR and Word Substitution. IJISME.

Prakash, V., & Tripathy, B. K. (2020). Recent Advancements in Automatic Sign Language Recognition (SLR). In *Computational Intelligence for Human Action Recognition* (pp. 1-24). Chapman and Hall/CRC.

AWARDS

Certificate of Accomplishment for 16th Annual Student Unmanned Air Systems Competition.

Certificate of Appreciation for oral presentation on Data Security for IOT Based Healthcare System - A cryptographic approach ICWRS & ICAFEE 2018.

Recipient of the Special Student Achiever Award from VIT University Vellore (2018-2020).

Finalist in HSBC Artificial Intelligence Hackathon conducted by HSBC and IIT Madras.

RESEARCH EXPERIENCE

Graduate Research Assistant

University of Alberta, Canada — *2023 – present*

Working with Dr. Osmar Zaiane on the development of MIRA, a mental health virtual assistant. My contribution includes extending MIRA's accessibility through the development of a chatbuilder platform, a conversation flow visualizer and the integration of additional conversational pathways.

University of Alberta, Canada — *2021 – 2023*

Worked with Dr. Alona Fyshe to study the neural representations of sentences, particularly metaphors in individuals with neurodevelopmental disorders using a decoding approach. We studied the decodability using word and sentence embeddings from large language models like BERT and RoBERTa.

Summer Research Assistant 2019
Cognitive Systems Lab, University of Bremen, Germany

· Worked under the guidance of Prof. Tanja Schultz and presented my three-month project on training an EMG-Speech system to operate on Silent Speech at CSL. Obtained phone level alignments for EMG signals through Lip Reading using 3D Convolutional Neural Networks.

Undergraduate Research Assistant 2020
VIT University, India

Worked with Dr. Jasmin T. Jose to identify textual handwritten content in damaged handwritten documents. The accuracy of the Optical Character Recognition (OCR) system was improved by introducing the word substitution technique: using character and distance analysis to perform spellcheck.

Worked with Prof. B.K. Tripathy on studying Automatic Sign Language Recognition. The findings were published as a book chapter.

WORK EXPERIENCE

· **Curriculum Development** Nov 2022 - Jan 2023
Work Integrated Learning Opportunity *Alberta Machine Intelligence Institute (Amii)*

Conducted independent research to curate course content for an interactive online training platform. The courses *Building an AI Product* and *Understanding AI beyond the Lab* were aimed at providing graduate-level students and early-career AI professionals in Alberta with an understanding of AI Founders' career paths and the tools necessary to succeed in it.

Technical Presentation Apr 2022 - May 2022
Work Integrated Learning Opportunity *Alberta Machine Intelligence Institute (Amii)*

Prepared and delivered a presentation for AI and Rehabilitation Workshop organized by Dr. Patrick Pilarski and AMII. Translated a workshop lesson plan into an engaging and interactive presentation.

Content Development Support Mar 2022
Work Integrated Learning Opportunity *Alberta Machine Intelligence Institute (Amii)*

Assisted the creation of AI/ML-focused labs to introduce participants to learn fundamentals of programming and effectively translated technical information to non-technical learners.

Graduate Teaching Assistant Jan 2022 – Apr 2022
Introduction to the Foundations of Computation *University of Alberta, Canada*

CMPUT 174 uses a problem-driven approach to introduce the fundamental ideas of Computing Science. As a TA, my duties included leading labs, grading assignments, and guiding students to understand the concepts better.

One Fourth Labs, IIT Madras Dec 2018
Content Development Intern (Deep Learning) *Chennai, India*

I was responsible for curating programming assignments for an online course on Deep Learning for a start-up founded by Professors of IIT Madras: Mitesh Khapra and Pratyush Kumar.

Siam Computing May 2018
Chatbot Developer *Chennai, India*

My responsibility was to develop a customer-friendly chatbot using Google's Dialogflow at a start-up for a retail enterprise. I developed a chatbot that could handle contextual questions.

PROJECTS

Hybrid UI - A system to improve internet accessibility for the visually impaired through a browser extension. Hybrid UI's primary functionalities include changing dark-themed websites to a lighter theme, increasing the font size and changing it to bold font, and enabling the use of voice commands for the purpose of navigation.

Noise Eliminator for Active Learning - An interactive machine learning-based algorithm that helps produce automated systems that provide highly accurate predictions, with a low number of training instances. NEAL can be used to improve predictions of any automated system and needs only a small subset of labeled data to produce stellar results.

Unmanned Aerial System - Team Ardra was a participant in AUVSI SUAS'18, held in Maryland, USA. The team designed, integrated, and demonstrated an Unmanned Aerial System (UAS). Special contribution to interoperability connections, establishment, and real-time visualization of obstacles.

Text Summarization - Implemented a Text Summarizer using an Encoder-Decoder LSTM (Long Short Term Memory) Model in Python. The Encoder with an embedded input is followed by an LSTM layer to produce a fixed-length representation which is used by the decoder to generate the output summary.

LANGUAGES AND LIBRARIES

Python, Git, Tensorflow, Scikit-learn, Transformers, Pandas, PyTorch, Javascript, Rasa, Docker

SUMMER SCHOOL ATTENDANCE

Summer Neurolinguistics School Moscow, Russia 2021
ACM Summer School for Data Science Goa, India 2019

COMMUNITY INVOLVEMENT

CSGSA Treasurer 2021-2022
Computing Science Graduate Students' Association, University of Alberta

Responsible for drafting the budget of the CSGSA and making sure that the organization manages its finances well.

GSA Councillor-at-Large (CAL) 2021-2022
Graduate Students' Association, University of Alberta

Represent graduate students by advocating for their interests to the university and providing additional voices on GSA Council.

GSA Equity, Diversity, and Inclusion Committee Member 2021-2022
Graduate Students' Association, University of Alberta

Responsible for ensuring that the GSA reflects the principles of Equity, Diversity, and Inclusion (EDI) for all its members in the interests of enhancing the graduate student experience and ensuring the existence of a welcoming environment and cohesive community for graduate students on campus.

VOLUNTEERING

Helphen, Project Kinder October 2019 - February 2020
Vellore, India

I taught English to young unprivileged children in interactive classroom settings. Through Project Kinder, we as an organization, strive to develop English-speaking skills among young minds and guide them to better opportunities in life.