Ajay Krishna Vajjala

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Education

- **George Mason University** Fairfax, VA
  PhD in Computer Science *Dec 2021 - Present*
- **George Mason University** Fairfax, VA
  Master of Computer Science *Jan 2021 - Dec 2021*
  Courses: Mining Massive Datasets with Map Reduce, Component-Based Software Development, Artificial Intelligence
- **George Mason University** Fairfax, VA
  Bachelor of Computer Science; Dean's List *Aug 2017 - May 2020*
  Courses: Operating Systems, Analysis Of Algorithms, Data Mining, Data Structures, Object Oriented Programming

Research Interests

- **Interests**: My research interests are in Cross-Domain and Context-Aware Recommender Systems. Specifically, I am interested in seeing how distance between domains affects recommendation performance, and i'm interested in incorporating deep learning into Cross-Domain Context-Aware Recommender Systems.

Skills Summary

- **Languages**: Python, Java, C, SQL, Unix, PySpark, React, Node
- **Tools**: Tensorflow, Scikit-Learn, GIT, Matlab, XCode, MySQL

Experience

- **George Mason University** Fairfax, VA
  Graduate Research Assistant - Prof. David Rosenblum *May 2022 - Current*
  - **Domain Distance for Cross-Domain Recommender Systems**: Working on building a novel approach to finding distance between two domains, and analyzing how the distance affects recommendations in a target domain. Using the RecBole-CDR library to run state of the art Cross-Domain recommendation baseline algorithms, to see the correlation between distance and performance.
  - **Deep Learning Framework for Cross-Domain Context-Aware Recommender Systems**: Working on a novel approach to incorporate deep learning in cross-domain context-aware recommender systems. Building off of the existing Neural Collaborative Filtering algorithm by incorporating context, and extending it to a cross-domain setting. Tensorflow is being used to build the deep learning model, and the RecBole-CDR library will be used to compare results against existing baseline models.
- **George Mason University - Center of Adaptive Systems of Brain and Body Interaction** Fairfax, VA
  NSF National Research Trainee Fellow *May 2021 - May 2022*
  - **Reentry and Corrections**:
    - Developed a website that provides incarcerated individuals with information on reentry and social service supports that they can use upon reentry from jail. The application's main objective is to provide incarcerated individuals autonomy over their reentry experience while providing these services in a easily accessible way.
    - Website was built using React for front-end, Node for back-end, and MySQL for the database
    - Partnered with American Prison Data Systems (APDS) and DJ Jail to pilot the website on APDS tablets across jails in the U.S. as soon as 2023.
- **George Mason University** Fairfax, VA
  Graduate Teaching Assistant *Aug 2021 - May 2022*
  - **Instructor for Introduction to Programming Class (CS112)**: Taught 60 person labs twice a week for two semesters, while creating programming assignments for the students to work on. Held office hours every week to help students understand programming concepts, and worked on grading labs and programming assignments for over 100 students.

Academic Projects

- **Movie Recommender System**: Built a Recommender systems using deep neural networks using the movielens dataset. Created an embedding for users and items, and fed the concatenated user and item embeddings into multiple deep layers using the tower method. Achieved roughly 90% rating prediction accuracy, and was optimized using Stochastic Gradient Descent.
- **NYC Taxi Trip Duration with Enhanced Decision Tree Regressor**: Predicted taxi trip duration using an enhanced decision tree regressor. An enhanced decision tree regressor fits the values in the leaf nodes to a linear regression model instead of taking the average. When comparing both the enhanced and regular decision tree regressor, the Enhanced model performed 80% better compared to the regular model. Used PySpark for this project, due to its large scale data processing and computation speed.
- **Amazon User Review Sentiment Analysis**: Developed a K-Nearest Neighbor model which classified a text review as either positive or negative with 80% accuracy. Pre-processed the data by removing stop words and punctuation, and generated word embeddings for each word in the review using Word2Vec. Represented each review as an average of its word embeddings, and performed KNN to classify whether a review is positive or negative.