ENGR-E 516: Personalized Mentoring System based on Graph Neural Networks

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1 Project Overview & Introduction

Social media allows us to easily access a plethora of content. For users that want to develop new skills or enhance existing skills, platforms like LinkedIn serve as a great knowledge base.One has access to articles, blog posts, research papers, videos and podcasts related to their interests shared by people of expertise in that domain.

Since this pool of content is so vast and diverse, users may feel overwhelmed and struggle to find a set of personalized resources that can help them leverage it effectively and help them grow. Our system aims to solve this problem using a cloud-based graphical machine learning (ML) model that is trained on the user's historical or current interests and provides them with a learning path.

2 Related Work & Gap Analysis

3 Proposed Tasks

3.1 Data Acquisition & Modelling

- Scrape data from a user's LinkedIn saved posts. We are interested in the text, comments, likes and media elements the post might have.
- Clean this data and design a database model that can store it efficiently and serve it to the machine learning model.
- Leverage the TensorFlow Extended (TFX) library to collect, label and validate data to make it production ready.

3.2 Feature Engineering

- Implement feature engineering, transformation, and selection with TensorFlow Extended by encoding structured and unstructured data types and addressing class imbalances

3.3 Data Augmentation & Preprocessing

- Implement feature engineering, transformation, and selection with TensorFlow Extended by encoding structured and unstructured data types and addressing class imbalances

3.4 Neural Architecture Search

- Effectively search for the best model that will scale for various serving needs while constraining model complexity and hardware requirements.

3.5 Model Resource Management

- Optimize and manage the compute, storage, and I/O resources your model needs in production environments during its entire lifecycle.

3.6 Model Delivery

- Implement ML processes, pipelines, and workflow automation that adhere to modern MLOps practices, which will allow you to manage and audit your projects during their entire lifecycle

3.7 API & GUI Development

- Allow the user to access the knowledge base through a front-end interface.
- Serve it as an application that communicates with the data through an API. Possible approaches include deploying this application as a container

4 Team Members & Workload Allocation

4.1 Sreesha Srinivasan Kuruvadi

4.2 Srinivas Kini

4.3 Karan Sharma

5 Planned Timeline

Timeline	Tasks
Week 1 - 3	Data Acquisition & Modelling, Feature Engineering
Week 4 - 6	Data Augmentation & Preprocessing, Neural Architecture Search
Week 7 - 9	Model Resource Management & Delivery
Week 10	API and GUI Development