Project Number: P36

Project Title: Course Insight and Skills Alignment Platform

Project Clients: Dr Basem Suleiman, School of Computer Science and Engineering and Arthur Chen

Project Specializations: Software development/Engineering, Web Application Development, Data Analytics and Visualization, Natural Language Processing (NLP),

Number of groups: 2

Main contact: Arthur Chen

Background:

The project aims to develop a web application platform that collect and aggregate course information (course outlines) from different data sources (e.g., web pages, other systems) and implement an LLM-supported module to summarize the topics, knowledge, and skills covered in each course. Additionally, the application allows users to input their completed courses, and work experience, and use AI based decision making system to assess how well their knowledge and skills align with project requirements.

Requirements and Scope:

Users

- Admin users can manage user accounts and the platform.
- Users with different roles and responsibilities can create their account, login and operate the system based on their roles and responsibilities.
- Users can edit/maintain their profiles.

Academic users

- Academic users (with privileges) can choose to scrape or collect course information from selected sources (e.g., web page, files, or other system). Collected course information will be saved and updated in a database with version history (timestamped).
- Academic users can add course to summarize by providing data source of the course information / outline (extracted from one or more data sources – files, web page, other system). Course summary can include key skills, knowledge areas, topics. This should be powered by LLM.
- Academic users can see and visualize the topics, knowledge, and experience of one or more course (both textual and visual summary)
- Academic users can add projects and specify project details (title, scope, requirements, skills, knowledge areas/topics, expected outcomes)

Student users

- Students can create their own profile and maintain it.
- Students can add/choose list of courses they have successfully completed. This can be done through manual selection of courses and through uploading academics transcripts. The system will provide a summary of the overall gained knowledge with different views. It will also provide summary of skills and knowledge of each course. The summaries will include textual and visual formats.
- Students can generate skills gap analysis through the system, highlighting the extent to which a student profile meets knowledge and skills of a project.
- Students can see list of recommended students who their profile best match their own knowledge and skills. Students may choose to join a group. This match should be powered by LLM.
- Students can see list of projects that best match their knowledge and skills. This match should be powered by LLM.
- Student can choose to share their profiles with other students and academics.

Required Knowledge and skills:

- Familiarity with web application development (front-end and back-end)
  - Technology stack can be flexible – e.g., MEAN stack.
- Familiarity with web development and testing frameworks and practices
- Familiarity with database design and management for storing data (e.g., NoSQL)
- Familiarity with UI/UX principles and implementation
- Familiarity with NLP techniques and libraries especially for LLM.
- Familiarity with Agile software development methods, practices and tools
- Familiarity with software testing, building and deployment.

Expected outcomes/deliverables:

- Project documentation including source code, system architecture and design, UI/UX, different types of testing, user manuals and guide, technical guide
- Responsive Web application which is accessible on various devices, e.g., tablets and smartphones.

Supervision:

Arthur Chen