

AI Student Advisor

Abstract

The project focus on creating an AI student advisor in the form of mobile application such that it can give tailor-made feedbacks and suggestions to students on their study path. It also provide a platform for discussions in academic plans which also improve accuracy of the AI student advisor.

Data collection methods include gathering a database of past students' academic results, modeling and training and AI for deep learning.

Introduction

Students often face difficulties in planning their study path, either due to the lack of understanding of oneself or incapability to estimate their own strength. According to a recent report from the University of La Verne, students have not decided their major when they are admitted to college [1]. They often rely on online statistics or seniors' advice. but find it difficult to use the advices and data wisely according to their own strength. As a result, students often end up with wrong choices when choosing majors [1] or courses.

However with the capability of AI, Students can find the major or courses that they will perform the best with ease. Reviewing study paths and results of past students together with your performance in different areas, the AI predicts your performance in different majors and courses. Questions may also be asked at the forum regarding major and course enrollments, the AI may give suggestions as well as the peers in the community. With the feedback of the community, the AI will learn and become more precise for each question being asked.

This project aims at introducing a mobile application to engineering students. It possesses two major features. First, it can predict your course grade and suggest courses. The mobile application prompts the user to enter past course grades and requests user to do a personality test. When user seeks for course or major selection advice, the AI first makes a preliminary prediction with the data it has about the user and the database of questions it has so far. The second feature of the mobile application is an online community for course selection advice. Students can either answer or ask for course or major selection advice. A student may choose an answer that helped the most as a "Best Answer". Together with the mechanism of upvoting and downvoting from users, the AI becomes smarter and can make more accurate predictions. The project will then be scaled to all HKU undergraduates.

Related Studies

There is a study in the past aimed to develop an AI student advising system. It adopted the method of AI personal assistance, allowing student to seek advice from the system with their

voice [2]. The project focused on the investigation of cognitive computing in speech-to-text conversion [2]. From the light of that, we observe the possibility of using mobile devices for academic advising. The previous studies focused on “how” AI provide academic advices to students while this project focus on “what” advices AI can provides to students.

Objectives

1. Create an AI advisor that provides predicted grades suggested courses and suggested major
2. Create an interactive academic advising forum with AI feedback mechanism which allows users to ask or seek for advices in courses or major selection.
3. Create intriguing mobile application features to attract universities students to engage in discussion

Methods

We will create a mobile application that supports both iOS and Android platforms. We will build some simple features such as GPA calculator and Personality test to collect data and save it in our database. We will also collect GPA and other necessary data. These collected data will then be used to train our AI model so as to implement our key features, such as course and major suggestion, and GPA prediction. On the other hand, we will build a forum to facilitate peer discussion on major or course enrollment topics. When sufficient questions and answers are collected, the AI can be trained to suggest courses or predict GPA for the students. We will also employ the techniques of natural language processing to generate tags for different questions' content.

Key features in the app: Peer learning platform, Course and major suggestion, GPA prediction, Optical character recognition (OCR)

Data Collection method: Manually entered grades, Personality test, GPA calculator, Linking with HKUportal, use OCR to scan grades on HKUportal

Technologies

For the mobile application, we will use Objective-C to develop the iOS side and Java to develop the Android side. Swift is not used because we are more familiar with Objective-C and have confidence in developing faster with it. Both Objective-C and Java are the native languages of the platforms, and they are more reliable and stable. For the backend, We are using Node.js and MongoDB to manage the database, it is because we are experienced with Node.js and Node.js support async functions which help improve the performance of the backend. Moreover, MongoDB is an NoSQL Database, which has a higher scalability than the traditional SQL database and we are more familiar with it. We will use Gitlab for the version control, as it is free

and stable. For AI, we will use Tensorflow to implement the AI model, as it have a large community base will help solving problems when we develop the AI.

iOS: Objective-C

Android: Java

Backend Framework: Node.js (TypeScript)

Database: MongoDB

Version Control: Gitlab

AI: Tensorflow (Python)

Possible Services: Amazon Comprehend, Alibaba Cloud, Microsoft Azure

Project Schedule

Sept	Deliverables of Phase 1
Oct	Development of mobile app (Basic UI, GPA calculator, Personality test)
Nov-Dec	Development of mobile app (Forum feature)
Jan	Deliverables of Phase 2
Jan-Feb	Data Collection (Questionnaire) +AI model research + training
Feb-April	AI model research + training
April	Deliverables of Phase 3

References

[1] "The Student's Guide to Choosing a Major - Best Colleges ," 2018. [Online], 2001.
Available: <https://www.bestcolleges.com/resources/choosing-a-major> [Accessed: September 26, 2018].

[2] UMICH, "UM-IBM SAPPHIRE PROJECT," *the University of Michigan*, 2017. [Online].
Available: <http://sapphire.eecs.umich.edu>. [Accessed: September 28, 2018].