The Bid for Project 14 | Third Choice

Team 2021.13

October 13,2021

Contents

1 Our Advantages

- For GUI design (front-end work), we are good at handling different user experiences and improving user-friendly interfaces. We have front-end development experience. In addition, we are familiar with using HTML5, CSS3 and JavaScript frameworks (React, Vue2.0) and UX frameworks (Fluent UI, material UI) and connectors. Familiar with how basic HTTP conversations works.
- For the code development, we are proficient in C, java and python. Have a specific understanding of the algorithm. In addition, our team members have front-end and back-end collaboration experience.
- For data processing, we are proficient in using database such as MySQL and SQLite to process massive amounts of data. In addition, most of our teammates work orderly and patiently when faced with massive amounts of information and data.
- For Artificial Intelligence, we are familiar with artificial intelligence methods and algorithms, and have experience in participating in Artificial Intelligence design projects.
- For human-computer interaction, we are familiar with the methodology of human-computer interaction, and can provide users with a beautiful, clear and easy-to-access interface based on the UI design experience of different users of the system.

- For software engineering, we have a thorough understanding and experience of software engineering, including gathering software requirements, prototype design, coding, testing, debugging and maintenance.
- For machine learning, we are familiar with and master the basic knowledge and understanding of machine learning (naive Bayes, decision trees, etc.)
- For code management, we are all familiar with git management. We have already built the repository on GitHub.
- In our team, every member actively participates in and cooperates with the team's work and arrangements. We actively communicate to ensure that everyone can participate in every process of the project to a large extent and work efficiently at the same time. Our members are eager for knowledge and willing to spend time on the project.
- Overall, for Project 14, we think we have a lot of confidence to make it and build it very well!

2 Team Introduction

2.1 Overview

Our team has five members: Haonan CHEN, Yuke GAO, Yongjing QI, Yifei SHAO, Zhihang Zhu. Group members will get the chance to lead the team alternately in the first two months. Yifei is temporarily selected as the leader in first two weeks. Unique skills provided by our members help our team to be professional and competitive for this project.

2.2 Member Statement

2.2.1 Haonan CHEN

- Have experience in building web with Nodejs in a web monitoring project. Good Java and web programming skills.
- Have experience in UI design about a WeChat Mini Program.
- Have experience in image processing. Participated in a project to detect regular gaps of different types of material.
- Have experience in AI method and algorithm. Participated in a project designing robot arm Have experience in UI design about a WeChat Mini Program.
- Have a good understanding about software engineer progress, including requirements, designing, coding and maintenance.

2.2.2 Yuke GAO

- Have systematically studied the C Programming Language, Java and other general programming languages.
- There is a certain theoretical foundation in various fields such as algorithms, computer foundations, relational database management systems, artificial intelligence, software engineering and so on.
- Familiar with the core technology of front-end development(HTML、CSS、JavaScript).

2.2.3 Yongjing QI

- Experienced in Web programming. Familiar with using JavaScript frameworks (React) and UX frameworks (Fluent UI, material UI) to build frontend of a web-based system. Experienced with collaboration of Front-end and Back-end. Familiar with how basic HTTP conversations works and experienced with using axios to exchange JSON type data to do data transfer and invocation.
- Familiar with Human-Computer Interaction (HCI) methodologies, have experience of UI design depending on different users of the system, to provide users with interface which is beautiful, clear and easy to access.

- Have a thorough understanding of SE process. Gained great experience from working within a summer research team to develop a web-based system. Especially familiar with requirements, designing and building process.
- Familiar with basic AI knowledges and some typical AI algorithms.

2.2.4 Yifei SHAO

- Can well use basic front-end programming language: Html5, Css3 and JavaScript.
- Have worked in a company as a front-end development trainee last summer. Have experience on Vue2.0, Vue3.0 and Familiar with front-end development and connector.
- Have well C and Python programming skills.
- Have experience on prototype design by using Modao.

2.2.5 Zhihang ZHU

- Have basic knowledge and understanding in machine learning and data mining.
- Have experience working in a company as a Product Manager Intern last summer vacation. Knows how to improve user experience from UI Design when using our

products.

- Have basic knowledge of front-end development.

3 Reason of Choice

Meaning of the project:

House decoration is an aggregate of a set of complex procedures, different applications need to be done under the specific time and sequence. The traditional decoration projects, decorate manager often multiple housing decoration project management, and how to manage different projects, control the concrete process of different projects, and arrange the completion of construction personnel in an orderly way to decorate. In addition, it is a complicated and relatively difficult work to effectively communicate and report projects with decoration building materials suppliers, house owners and construction staff. Therefore, we want to do this project to optimize the decoration project management system. This application can not only support the work of the manager, but also a good application to keep homeowners informed of decorate progress.

Our team consists of both CS and CSAI students. It is also a great opportunity to cooperate with our team members to put our knowledge into really practice to really create a meaningful and

useful application that can be used in our daily life.

Technology used in the project:

Beside the meaningfulness of the project and the great willingness of engage, developing the system is a precious opportunity for us to learn and practice professional knowledge such as programming skills of Python and Java, web-scrapping, data visitation ability and some other skills.

The mainly used technology, web-scrapping is a useful and still developing tool in modern digital world. With the rapid development of the network, the World Wide Web has become the carrier of a large amount of information. How to extract and use this information effectively has become a huge challenge, to solve the problem, the web-scrapping is used. A typical scenario of using web-scrapping is market analysis. Many of the things we do on the Internet generate a lot of "user data", such as comments, tweets, purchases and so on. Data collection and analytics have become key skills to drive business decisions. The Internet is now the best place to analyze market trends, monitor competitors or get sales leads. We are eager to further research in this filed.

Future Planning:

Apart from these factors, web scrapping, data visualization and other web-technologies are significantly used nowadays, these techs will have a significant impact on our study and may lead us to find out what we really like and what we want to study in our graduate study, and may even influence our career planning, what we want to make a living for in the future.

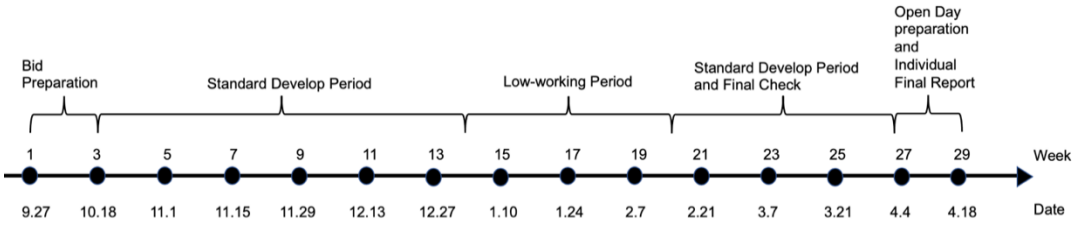
4 Project Planning

4.1 Overview

The whole module is from 22/9/2021 to 25/04/2022, while the topic will be certain on 15/10/2020. Thus, we divided the whole plan into four period. We arrange 27/09/2021-10/10/2021(Week1 – Week2) as Bid Preparation Period, 18/10/2021 – 02/01/2021 (Week3 – Week13) and 14/02/2022 – 10/04/2022 (Week20 – Week27) as Hard-working Period. Due to the Examine and Spring Festival, 03/01/2022 – 13/02/2022 (Week14 - Week19) is Low-working Period. Meanwhile, 11/04/2022 – 25/04/2022 (Week28 – Week 29) is arranged for Open Day preparation and individual final reports, etc.

In conclusion, there are 21(19+2) weeks separated in two

semesters for conventional working with estimated 10 hours per week per person.



4.2 Detailed Scheduled Planning

- Week1-2: Choose projects and prepare for the bid.
- Week3: Research on existing websites that perform similar functions. Research on the satisfaction and feedback from students and staffs about current provided systems. Discuss and identify the methods and techniques used for the project. Set up team website.
- Week4-5: Upload group project site before 28th Oct. Write requirements, specification documentations for the project. Design prototype and UI page. Assign different parts of project to individuals.
- Week6: Set up the develop/test/deploy environment. Get familiar with proposed techniques and frameworks.
- Week7-13: Transfer the structure into codes. Observe, discuss and solve the implementation level problems in the beginning. Optimize the system structure and APIs. Write detailed test plans.
- Week14-19: Self-study, self-review, coding and debugging

• Week20-25: Complete software V1.0. Fully connect all the subsystems and do integral tests. Get feedback from users and upgrade the software.

• Week26: Peer review codes. Final check the system. Finish and gather necessary documents for the final report.

• Week27: Organize all the work and prepare for the Team Final Report and Presentation.

• Week28-29: Open Day preparation and individual final report.

4.3 Detailed Personnel Planning

- **Haonan CHEN**

Secretary: record and note the meeting

Quality Assurance Leader: Lead tester, confirm requirements

- **Yuke GAO**

Web Building Manager: manage the project site, test the front-end pages

- **Yongjing QI**

Editor: ensure document structure, code standard structure, integration of contributions and creating templates

Repository Master: Managing the repository on GitHub

- **Yifei SHAO**

Team Leader(temporary): arbiter, contactor, overall planning and

coordination. Team leader should be the chairperson who write the agenda in the meeting. Integrate weekly logs and upload.

UI designer: UI and prototype design

Open-Day Producer: main producer of our project in Open-Day

- **Zhihang ZHU**

Technical Lead: System architect, lead Programmer

5 Project Ideas

5.1 Ideas on Management

- Every member should be assigned with different parts of the project work. Apart from weekly meeting, periodic meeting is highly needed to be held in every two weeks in order to ensure the working process and code quality.
- Every member should write daily journal to record what he/she has done to the project.
- GitHub is used for our general file sharing and version recording.
- Related requirements and specification will be recorded and upload to GitHub. One or two of our team members will be assigned to maintain and develop the data in GitHub.
- The target user can be students, campus staffs or back-end administrator. Different versions of the system should be developed to meet these demands.

5.2 Ideas on Techniques

- Database: Redis (Key-Value database), SQLite. These platforms can cope with big data well. Also, the chosen database needs to be run in multiple platforms like iOS (Mobile phone) and Windows (Personal Computer). For API management, we plan to use Swagger to manage interface documents.
- Website construction and maintenance: Web crawler are used for gathering information from different campus official websites and their back-end data. Otherwise, our team members are assigned to maintain the website and database.
- Data Analysis and pre-process: To fulfill the user requirement, related algorithms should be developed to find the relationship among data from different sources.
- Data visualization: Using maps and chart to give user intuitive event notification and daily schedule. Python can be the best tool to realize these functions.
- Web Framework: Vue.js(3.0) will be our first choice and it will be used to modularize the code and test front-end data visualization. Bootstrap will be used to design the front-end web pages for different kinds of platforms (mobile system and personal computer).

- Code management: GitHub is for version control of the code. Besides, two of our members are assigned to test the existed code and check whether they are explained precisely and clearly. Regulations of the codes should be applied to every stage of the project. Each part of the code must be utilized for one or more function and meet the requirements and specifications. Junit or Pytest will be used for testing code's functions property.