CSCI 4976-01
Web Science Systems Development
Dr. Callahan
Spring 2022

RPI Connect Project Proposal

Project Name: RPI Connect
Team Name: EM&EMs
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Summary of proposed project

RPI Connect is a one-stop app for group study and peer tutoring specifically designed to connect students in every grade to foster an increased understanding of course material both during and after one takes a class. As any student here can tell you, RPI is an academically challenging school. Depending on your major, you can find yourself putting in countless hours towards homework, studying, or lab work every week. The professors at RPI work hard to make sure that all of the necessary resources are available to their students, but sometimes students need help that comes from outside of office or class hours. The student may need to narrow down a concept question they have, or may be doing work late at night or in the early hours of the morning. That is where RPI Connect comes in.

The goal of RPI Connect is to provide a platform for students to connect with each other for the purpose of succeeding academically. In some courses, the sheer number of students enrolled in a course can overwhelm the teaching staff. The professors and TAs put a lot of time into making themselves available through Discord or WebEx and office hours; we are aiming to provide a service that will help students outside of those time constraints, and to aid professors with the workload of helping students outside of the classroom. With our product, students will be able to connect with other students that are taking the course with them or connect with students who have taken the course previously. By making other students available as resources here at RPI, we can foster a community in which the members actively help one another to succeed.

Each semester, students can log in to our website and update which courses they are currently enrolled in. Additionally, when signing up for the first time, students will be prompted to input every course they have historically taken and passed. This will create a complete profile for each user's time at RPI and provide accurate information for when students need help later. At the end of each semester, the website will shift currently enrolled courses to past courses, and at the beginning of the next semester the students will be prompted to enter their current courses again.

Competitors

Webex Teams has some of the same functionality as we are looking to implement, where you can view the other students in your course and chat with them in a Team group chat if your professor chooses to make a team. The downside of this is that it is up to professors to create a Team space for their students, and does not allow for students to connect with any students from previous semesters.

On the Canvas class roster, used by some other universities, you are able to view the students in your class, accompanied by a photo and email. You are able to message students in your class as well as your professor. RPI's LMS does not support this functionality, and this does not allow for current students to connect with students from previous semesters.

LMS's Messages tab allows students to select a class and send a message to other students in their class or their professor. However, most students are not aware of this feature and as a result, it's rarely used. The RPI academic discord has a similar function where students can message other students, but unless a channel is created for each class, there is no way to determine its students.

ALAC tutoring offers drop-in tutoring for certain introductory classes, usually populated by freshmen. While ALAC offers solidified tutoring times, our site will create and foster relationships that will lead to guidance and instruction for students in any class.

Stakeholders and potential users

The main stakeholders of our site will be RPI students as they will be the primary group interacting with and benefiting from the site, especially since they are interacting with it in two complementary ways. First, they will be the ones submitting and asking the questions about their classes. Second, they will also be the ones responding to and answering others' questions. Essentially, in terms of RPI Connect, RPI students will act as both the students and the teachers. This leads to benefits unsurprisingly coming from both the assistance students receive with their coursework and the increase in understanding of past material that comes from past students responding to their classmates' queries. In fact, peer collaboration leads to an overall general improvement in the quality of life of a classroom. One study found that, when classmates confer with each other after attempting an assignment, "41% of incorrect answers are switched to correct ones, while only 18% of correct answers are switched to incorrect (Morgan & Wakefield, 2012)" (Tullis). The study continues to point out that peer learning "improves learners' conceptual understanding (Duncan, 2005; Mazur, 1997), reduces student attrition in difficult courses (Lasry, Mazur, & Watkins, 2008), decreases failure rates (Porter, Bailey-Lee, & Simon, 2013), improves student attendance (Deslauriers, Schelew, & Wieman, 2011), and bolsters student engagement (Lucas, 2009) and attitudes to their course (Beekes, 2006)" (Tullis). RPI Connect will also serve as a way to extend the educational resources provided by TAs and mentors by offering them an inside look into topics students are struggling with in the course. Students in all grades and with all levels of responsibility will benefit from RPI Connect.

Both professors and academic faculty and parents of current RPI students will act as

indirect stakeholders to our site. While their motivations are slightly different, both will benefit from students having a streamlined, consolidated, and easily accessible platform for academic help. Professors want their students to succeed, and RPI Connect will provide a helpful support tool to help bolster a professor's teachings and lead to students with a deeper understanding of the material taught to them. RPI parents also want their students to succeed, but their desire comes from the love they have for their child and wanting to see them fulfill their potential. In this way, the consolidation of homework help and community-oriented nature of RPI Connect improves the RPI experience for both students and faculty. Lastly, both ITWS faculty members and students will act as stakeholders in RPI Connect. Since this app is being developed in tandem with the Web Science Systems Development class, both groups will have insights and experiences that could give a unique perspective during the development of the site.

Technologies we intend to implement

We plan to implement Google Identity Services, a sign-in SDK for the web, for student logins. This will provide our app with the security needed for students to feel safe sharing their information and classes taken. Google Identity Services will also make it easier for users to enter our website, with one-tap sign up and automatic sign-in after they have an account.

We will also incorporate Discord widgets in order to host channels for classes with current and previous students and to allow for direct messaging between students.

We will be using the MEAN stack: MongoDB, Express.js, Angular, and Node.js.

Functional and non-functional requirements

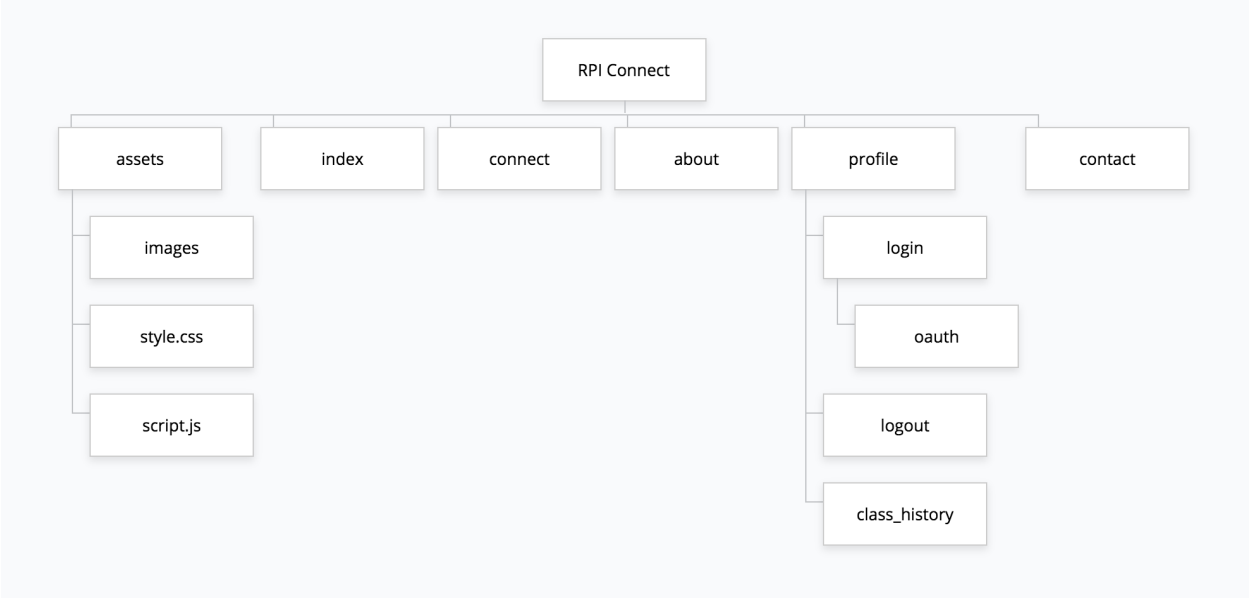
The primary purpose for our app is to allow students to connect with each other to foster more academic success for the RPI community. One essential functional requirement is that students need to be able to log in to the app. To accomplish this, we will be using Google Identity Services, which makes it easy for students to log in since they can sign in with their Gmail. Students also need to be able to add classes they have passed and classes they are taking, view who is taking or has taken their classes, and message other students. We will also be implementing Discord widgets on the app for direct messages between students and channels for classes to further the support provided by RPI Connect.

In order to achieve our goal of usability, we need to keep our app simple so that students want to sign on and use the site. Using the Google Identity Services makes it easy for students to log in since they can sign in with their Gmail. It will also allow students to skip the two-factor authentication using CAS and DUO that RPI has implemented for all of their affiliated websites. Having both a desktop app and a mobile app will allow us to stay up to date with current technology. Additionally, we will ensure our website is optimized for all commonly used browsers. We want to make this product easily accessible to any and every RPI student. We will also need to be able to support the entire student body using our program at the same time. Lastly, we want RPI Connect to be scalable and adaptable in order for us to be able to extend it and add new features as need arises.

Estimated Project Schedule

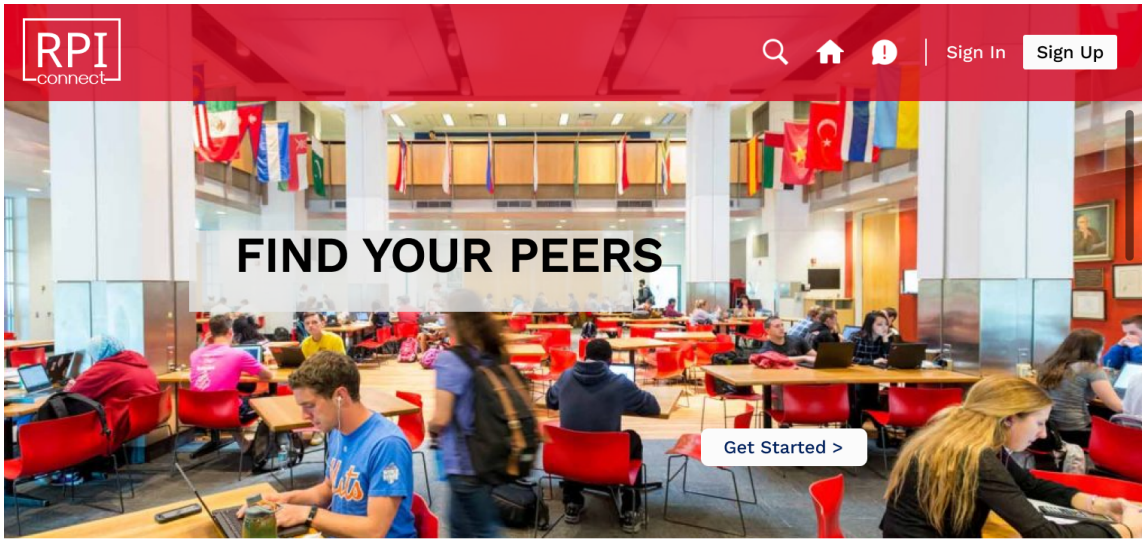
Proposal Due	Tuesday, January 25
HTML & CSS Outline	Tuesday, February 1
jQuery/JavaScript Implementation	Friday, February 11
Backend Implementation (MongoDB)	Tuesday, February 22
Midterm Presentation	Friday, March 4
Security Implementation	Tuesday, March 22
Final Project Detailing/Bug Fixing	Friday, April 8
Project Review/Presentation Preparation	Tuesday, April 12 - Friday, April 15
Final Presentation	Friday, April 22 - Tuesday, April 26

Sitemap of our web app



Wireframes

Desktop- Home Page



WHY NOT CHANGE THE WORLD... TOGETHER.

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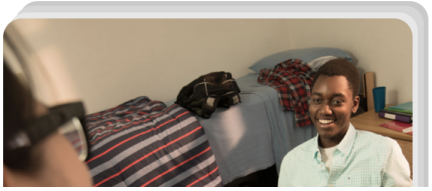
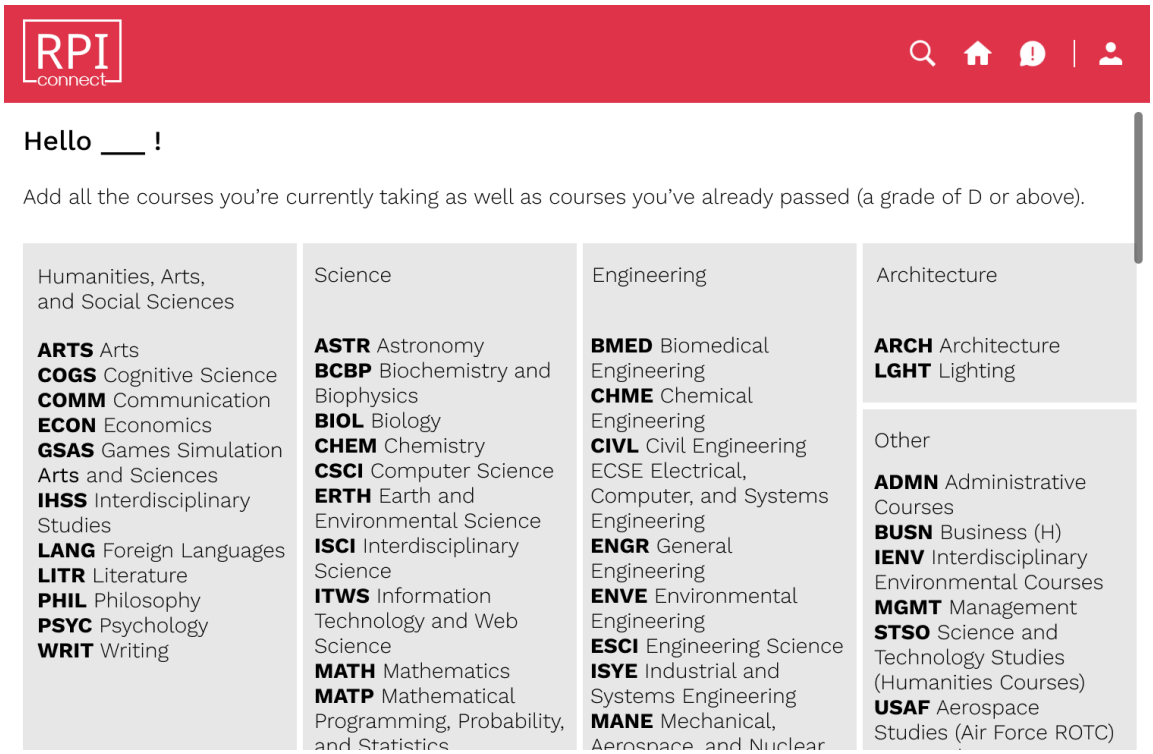
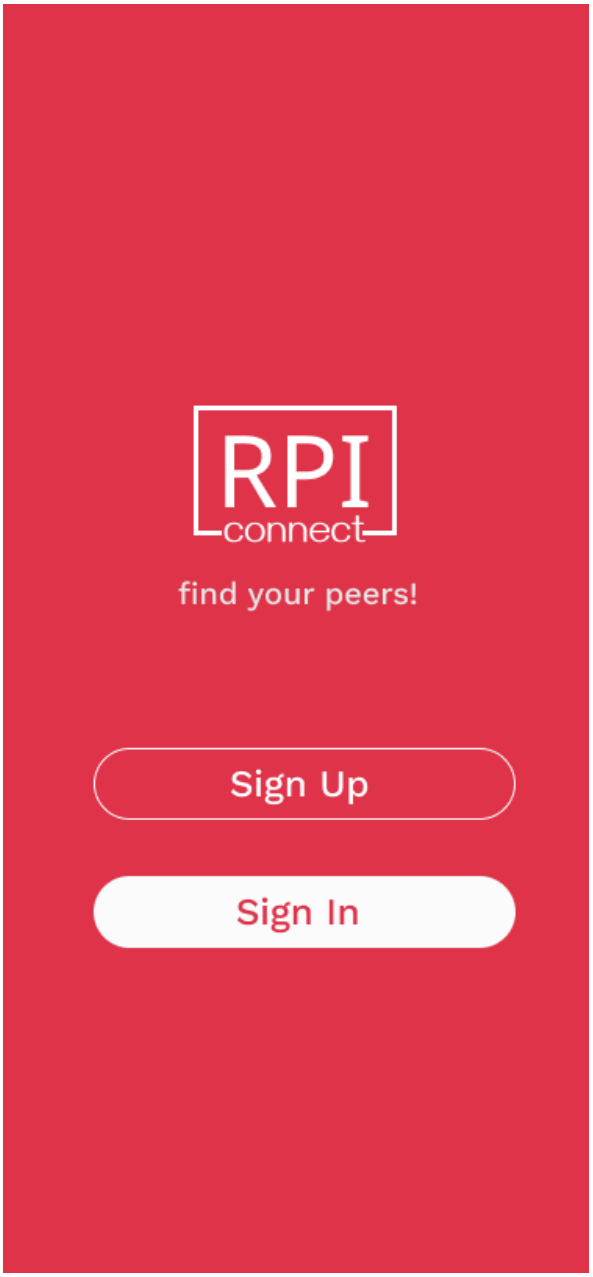


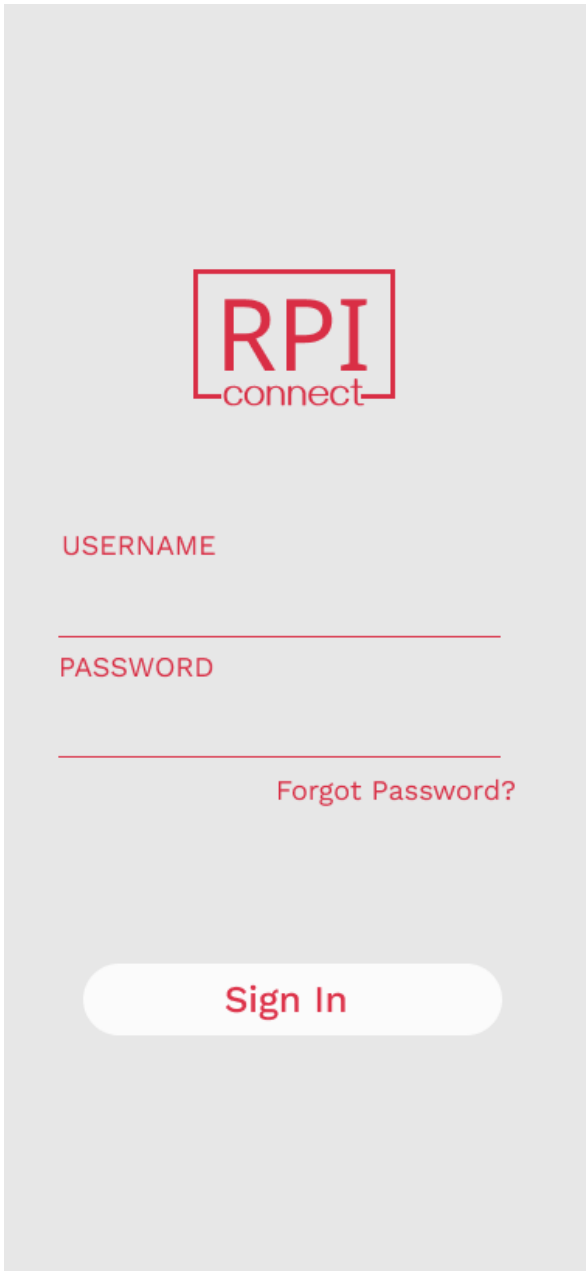
Desktop- Page that prompts users to add classes (after first logging in, can be updated at any point & accessed through their profile)



Mobile- Sign In/Up Page



Mobile- Sign In Page



Works Cited

Tullis, J.G., Goldstone, R.L. Why does peer instruction benefit student learning?. Cogn. Research 5, 15 (2020). https://doi.org/10.1186/s41235-020-00218-5.