

# ColabBook: An online collaborative notebook for remote research and learning.

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## Introduction

These days, remote learning and collaborations are becoming more and more important. This project seeks to develop a modern version of the science notebook which will support modern input devices, handwritten notes, and computer-generated documents (e.g., pdfs, powerpoints, Jupiter notebooks, etc.) It will support versioning so that the notebook remains a valid science document. Furthermore, more collaborative tools are being integrated to make the notebook into a team-centered system that supports remote collaboration as well as remote teaching.

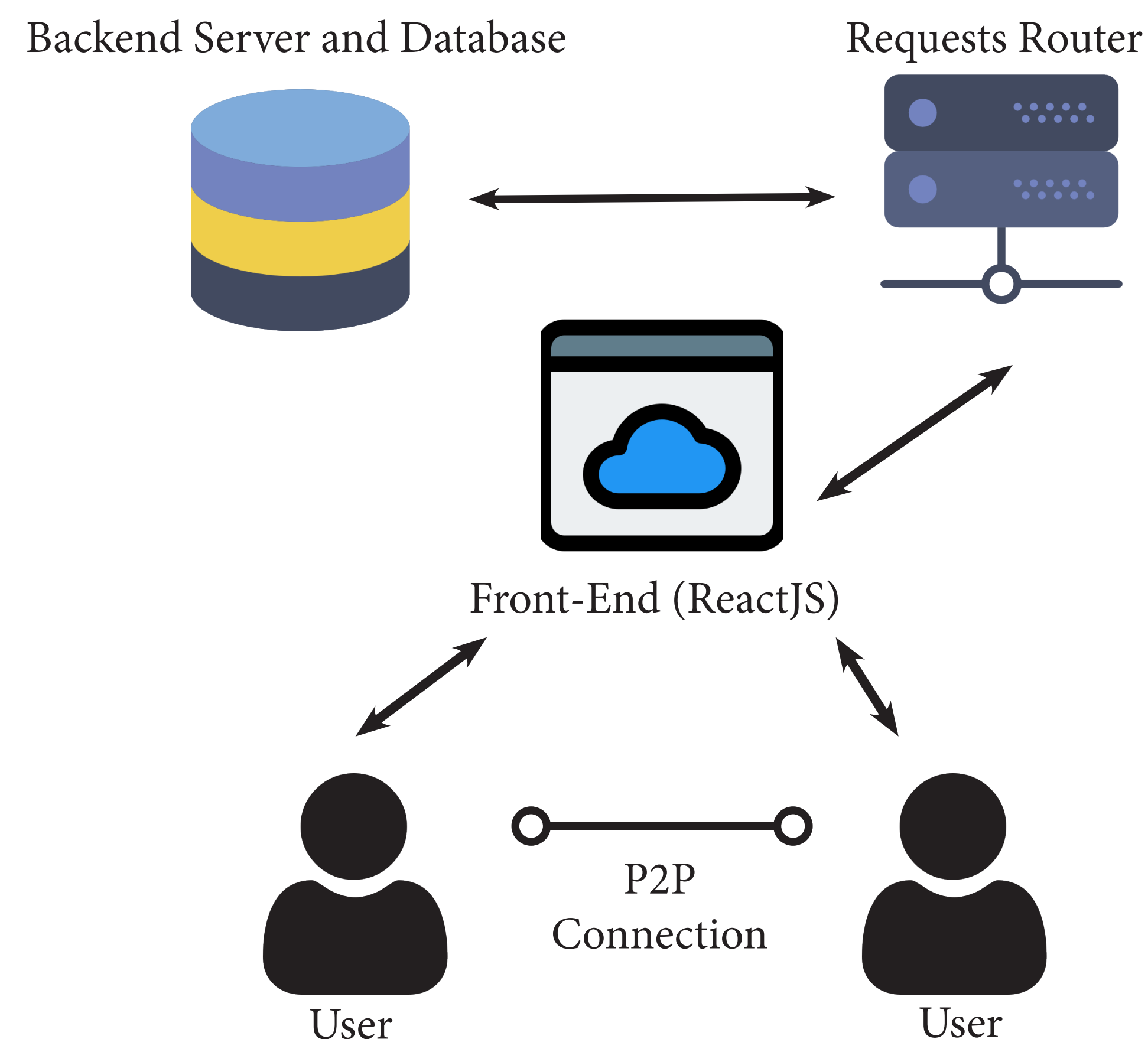
## Key Features

- Stream a notebook with others by sharing the notebook link
- Add text, hand-drawing, and PDF into the notebook
- Chat with other connected users
- Video / Audio conferencing with 4 connected users (with more participants supported in the future)
- Insert PDF file into notes
- Offline working mode
- iPad Apple Pencil supported

## Design

- Logged in users can create notebooks and view privately shared notebooks. Anyone with the link can view public notebooks.
- Each notebook contains infinite-space pages. Users can add text boxes, use a mouse or an Apple Pencil to draw, import a PDF file and annotate, and conference with others via video/audio and chat.
- All notebook content updates are stored to the database and broadcasted to other connected peers in real-time through P2P (implemented via Easy RTC)

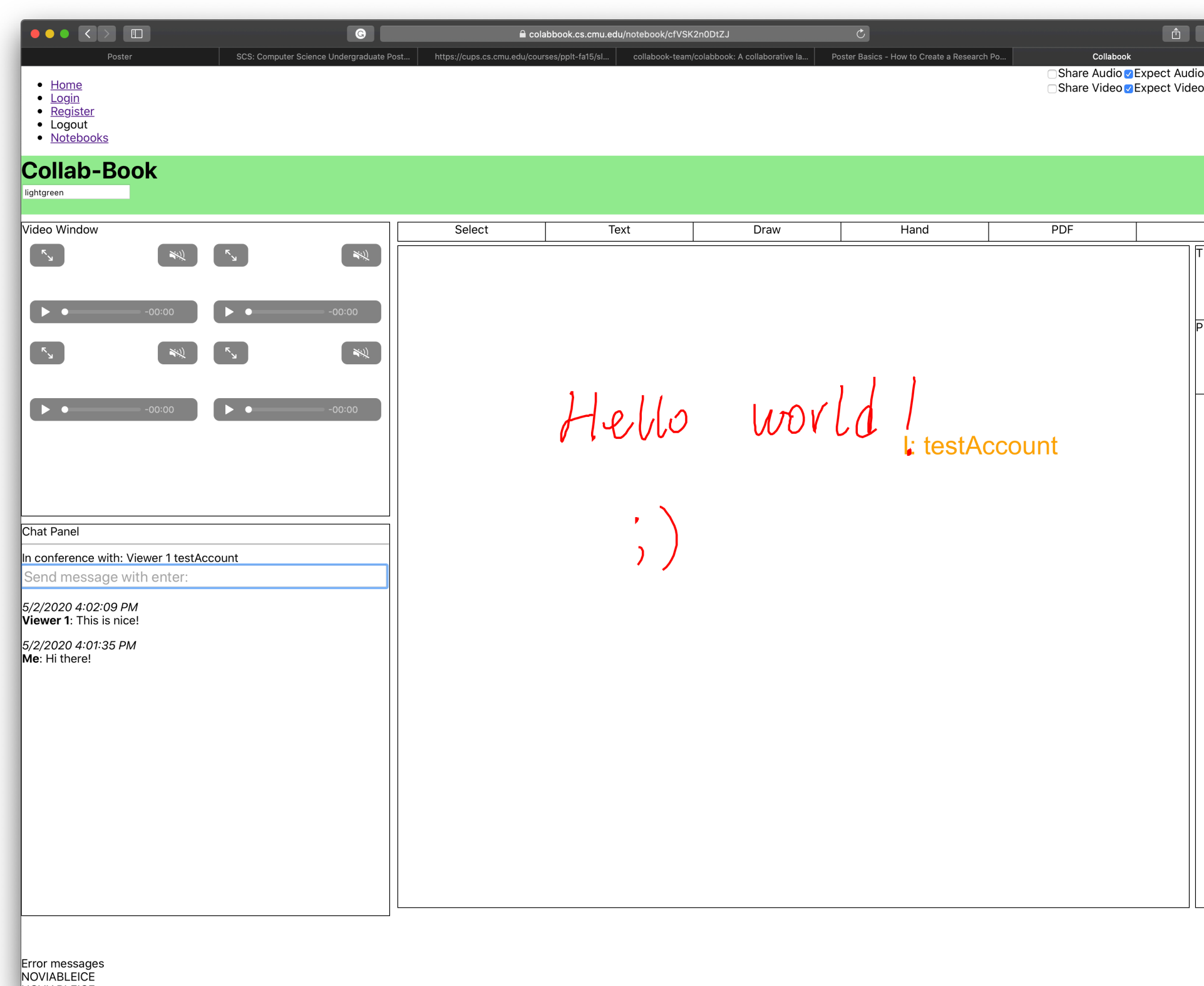
## Server Architecture



- User interacts with the front-end, requests are sent to the backend and database through a router.
- Users also talk to each other in a P2P fashion through EasyRTC.

## Screenshots

Figure. Current notebook interface with live collaboration.



## My Contributions so far

- I deployed the dockerized ColabBook components to Amazon AWS Cloud and made the website live.
- I added Apple Pencil support to the drawing feature.
- I implemented offline working mode:
  - If the user is offline, save all the changes made to notebooks to the browser's local storage.
  - Once the user is online again, upload all the changes saved in the local storage to the server, and remind the connected peers to sync up.
- I added a CI for checking ReactJS code style / syntax.
- Automatic RTC connect for logged in users.
- Database preservation for docker instances.

## Challenges / My Learning

I am familiar with app development and server-side development; however, web development with React was a completely new field for me. This project gives me the opportunities to learn a lot of practical skills in web development (and teamwork) that extend the knowledge I learned in class.

## Future Work

- Store uploaded files on expandable cloud storage like AWS S3.
- Improve the current user interface
- Allow more participants to perform audio/video communications.
- Support adding keynote files, PowerPoint files, Jupiter notebooks and more into the notebook.

## The current Team

Current ColabBook Team members:  
Seth Goldstein (seth@cmu.edu) [Advisor],  
Shunzhe Ma (shunzhem@andrew) [Cloud / React Development],  
Ishika Saxena (isaxena@andrew), [Front-end]  
Mansi Agarwal (mragarwa@andrew) [UI]