# Crosshatch: A Web Application for Crossword Collaboration

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## 1 Motivation and Vision

When doing a crossword puzzle from a physical newspaper, it is easy for a few people to gather around and work on solving it together. This is because all of the clues are visible at once, so each person can scan around for clues they know the answer to. However, this technique for crossword collaboration does not extend well into the digital world. Most major websites that host interactive crosswords only show a small subset of clues (e.g. The LA Times [2]) at a time, forcing all collaborators to focus on the same small portion of the clues. In the authors' personal experience, this is an inferior way to collaborate on a crossword: a lot of the fun of joint crosswords is rapidly going back and forth in different areas of the grid, calling out newly discovered answers.

To solve this problem, this paper proposes Crosshatch: a web application for crossword collaboration. Crosshatch will allow multiple participants to work on the *same* crossword from their own personal devices (in a way similar to document-sharing services, but for crosswords instead of general documents). To make finding and solving crosswords easy, Crosshatch will provide access to multiple free daily crosswords from around the US (LA Times, Wall Street Journal, USA Today, etc.) and feature a convenient user interface for solving.

The ultimate aim of Crosshatch is to provide a crossword collaboration experience that is superior to all other online options.

### 1.1 Related Work

## 2 Proposed Work

Expanding on the overarching vision expressed in Section 1, the aim of the Crosshatch web application is to provide the following specific features:

- A convenient UI for interacting with and solving a crossword puzzle in a web browser
- The ability for multiple people (at least three) to interact with the same crossword puzzle at the same time from different devices
- Daily crossword ingestion from at least one popular free source (LA Times, Wall Street Journal, USA Today, etc.)

### 2.1 System Architecture

In order to execute on the goals of this project, there are multiple important architecture and design decisions that must be made. Since Crosshatch is a web application, an immediate crossroads is the choice of web libraries. Vue and FastAPI have been chosen as initial options for frontend and backend libraries respectively, but are subject to change. Sections 2.1.1 and 2.1.2 explain the reasoning behind these choices. More fundamental than these choices though, is the choice of architecture for the collaboration feature. There are two primary options for this, which are explored in Section 2.1.3. Finally, there is a discussion of crossword data ingestion in Section 2.1.4.

#### 2.1.1 Vue

Vue [3] is an approachable, versatile, and performant JavaScript framework that is rapidly growing in popularity (it currently has 188k stars on GitHub [1]). The authors have some experience with other frameworks like React, Django, and Angular, but want to try something new and interesting. Vue is both powerful and simple to get started with, so there are not any expected obstacles relating to it. However, if it does end up being a problem, it is possible to pivot to something slightly more familiar like React.

#### 2.1.2 FastAPI

#### 2.1.3 Collaboration

#### 2.1.4 Data Ingestion

### 2.2 Deliverables

There are three concrete deliverables for the proposed project:

- The entire source code for Crosshatch
- A final report explaining the design and implementation of Crosshatch
- A comprehensive demo of the final working web application

## 3 Timeline

### 3.1 Stretch Goals and Future Work

# References

[1] GitHub. vuejs/vue. https://github.com/vuejs/vue. Accessed: 2021-09-23.

[2] LA Times. Daily Crossword. https://www.latimes.com/games/daily-crossword. Accessed: 2021-09-23.

[3] Vue. The Progressive Javascript Framework. https://v3.vuejs.org. Accessed: 2021-09-23.