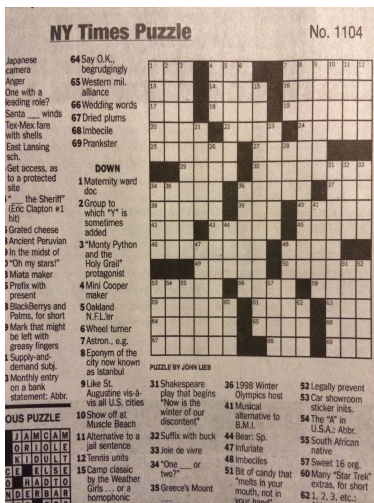


Crosshatch

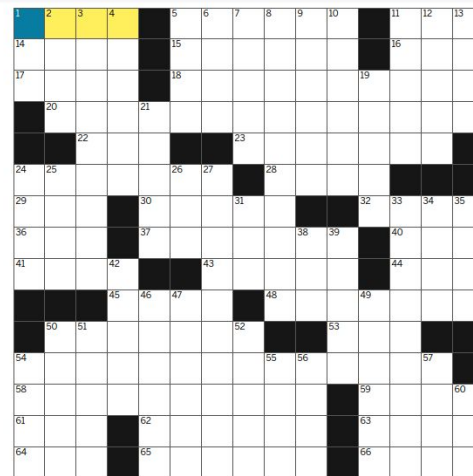
Charlie Gunn & Zach Minot

Motivation

- It is easy to collaborate on physical newspaper crosswords
- This is more difficult online due to few clues showing at once
- We like crosswords <3



1 ACROSS • "The Giving Tree" author Silverstein



ACROSS

- 1 "The Giving Tree" author Silverstein
- 5 Gravelly voiced sort
- 11 Top (out)
- 14 Ritz
- 15 City on the Rio Grande
- 16 Flamenco dancer's cry
- 17 Org. mandating eyewash stations

DOWN

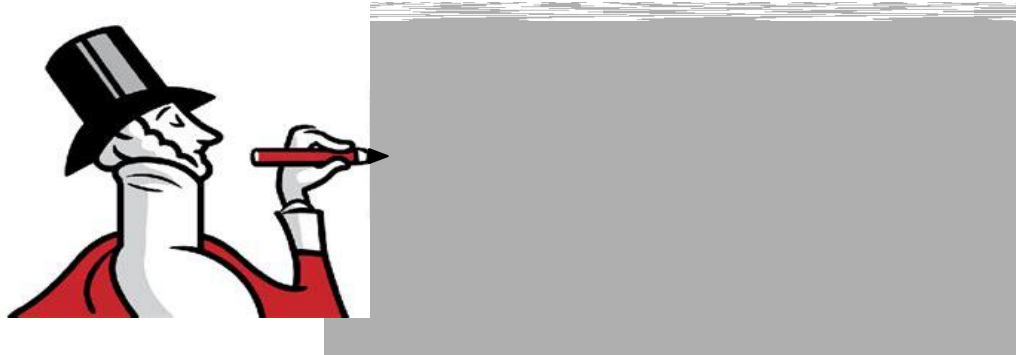
- 1 mo
- 2 Muzzle
- 3 What some Woodstock attendees eventually became
- 4 Seize eagerly
- 5 Go over again
- 6 Cockeyed
- 7 Table setting item
- 8 House

L. A. Times, Thu, Sep 23, 2021 by Ed Sessa / Ed. Rich Norris

Powered by [PuzzleMe™](https://puzzleme.com)

Our solution!

- **Web application: Crosshatch**
- A convenient user interface for solving crossword puzzles
- Collaboration from different devices
- Daily crosswords from popular free source (e.g. *LA Times*, *Wall Street Journal*, *Universal Daily*, etc.)



Related Work

- Collaborative real-time editors
 - instantaneous, simultaneous data editing
- Examples
 - Google Docs
 - Microsoft Office on the web
 - Quip
- Many different ways to implement
 - centralized, P2P
 - push-based, semi-synchronous



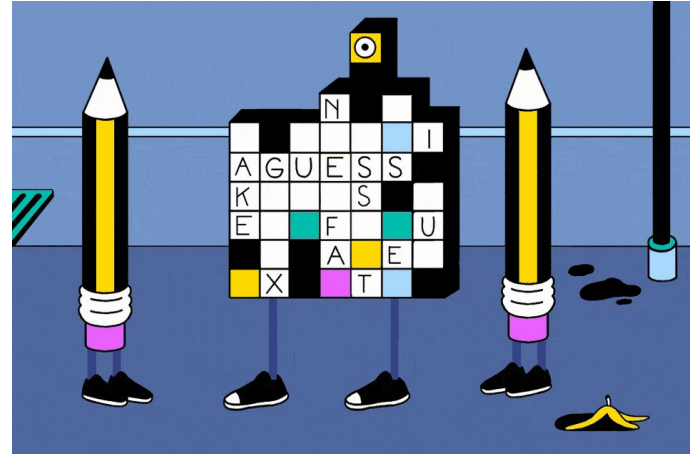
Google Docs



OneDrive

Related Work

- Many collaborative editing tools have to deal with multi-location, large edits
 - Conflicts can appear
 - How to merge them
- Crosshatch has simple data entry
 - Single character input
 - Explored more later



System Architecture Overview

- Frontend framework
 - **Vue3**
- Backend framework
 - **FastAPI**
- Database for Persistence
 - **Postgres**
- Ingestion of Crosswords from Newspapers
 - **crosswordfiend.com**



Vue.js

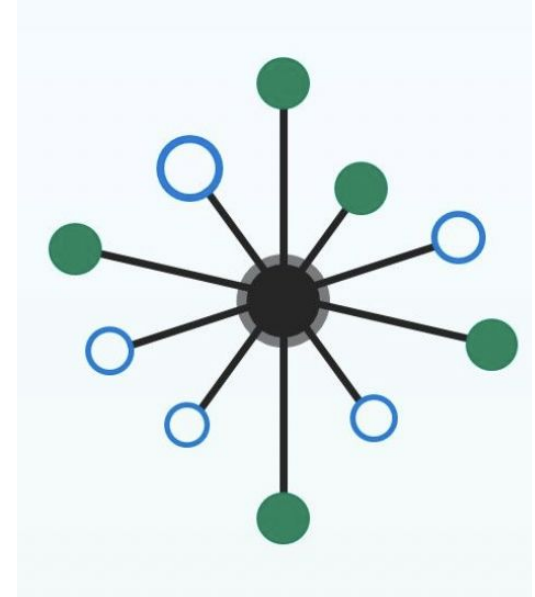
FastAPI



Collaboration

- **Centralized server**

- All persistence and communication goes through the server
- Edits are passed to backend and then distributed to all other relevant nodes
- Database stores blank crossword metadata
- File storage temporarily on backend



Edit Handling

- Each edit in a crossword is **atomic** and the location is **statically determined**
- This eliminates all problems related to conflicting edits
 - The backend can just accept edits as they roll in
 - As long as it distributes updates before accepting a new edit, synchronization is guaranteed

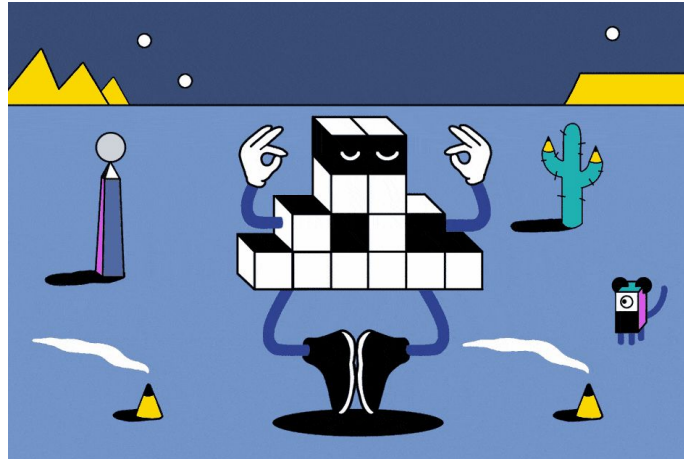
Deliverables Produced

- **Source code**
 - Located on github and also have a zip file of the code at the time of this presentation
- **Final Report**
 - Discusses information in this presentation in more detail
- **Working deployment and demo**
 - In class! And people can use it now
- **This presentation video**
 - :)

Demo!

Stretch Goals and Future Work

- Optional incorrect character detection
- UI customization (increase crossword size, add colors to letter inputs, customize controls, etc.)
- Adding a save-and-quit feature
- Adding a chat function



Final Thoughts

- We had a lot of fun!
- Thanks for listening

