

FULL-STACK SOFTWARE ENGINEERING FELLOWSHIP SUMMER 2022

Data & Technology Services, Austin Transportation Department

Mateo Clarke — Head of Software Engineering

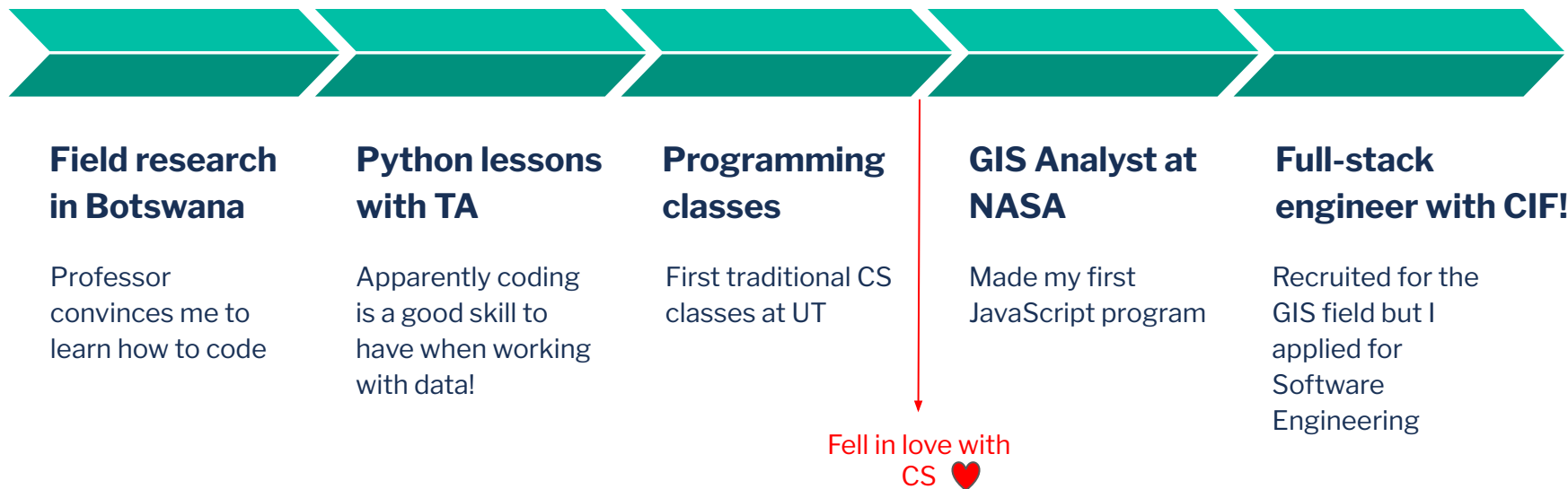
Patrick McDonnell — Senior Product Manager



ROSE EICHELMANN
University of Texas at Austin
Sustainability Studies & Geography

HOW I GOT HERE

FROM FIELD RESEARCHER TO FULL STACK ENGINEER...



EXPECTATIONS VS REALITY



**Expectations
vs Reality**

EXPECTATIONS

VS

REALITY

Imposter syndrome

Bureaucracy

Hopes:

- Grow confidence in my programming skills
- Learn web development
- Contribute to open-source software

Welcomed with open arms

Felt like a peer

Jumped into a completely new tech stack

Contributed features to latest Vision Zero Release

WHAT I LEARNED

React JS



How does rendering a website work?

HTML document

HTML
parser

DOM tree

CSSOM
tree

JavaScript
parsing

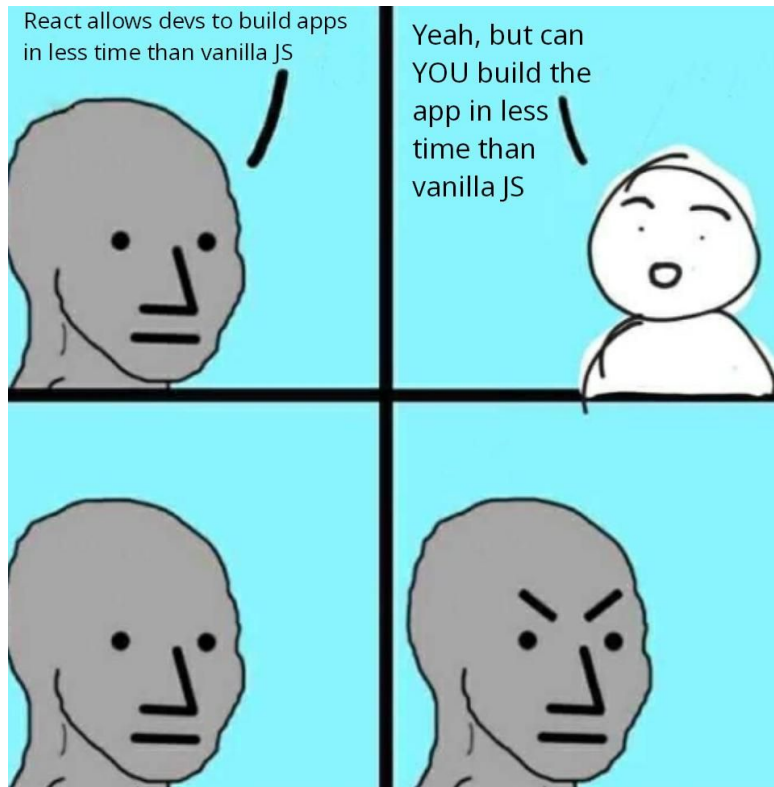
WHAT I LEARNED

React JS



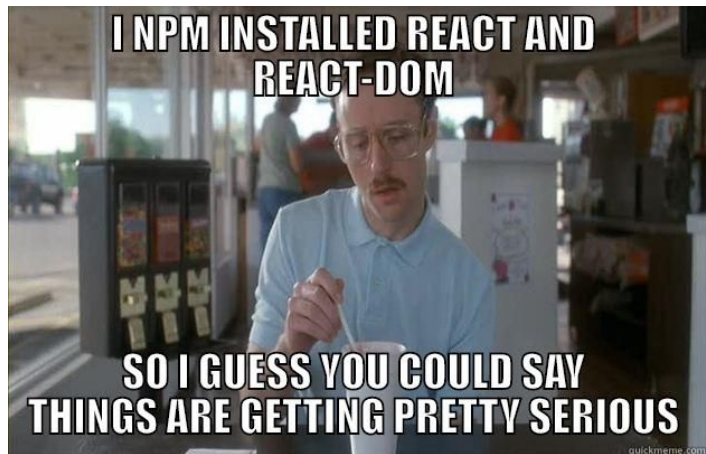
So... where does React come in?

React makes it easier to build user-interfaces!



WHAT I LEARNED

React JS



React is a JavaScript library for building **user-interfaces**

Component based

Combines JavaScript and HTML to create **JSX**

Modular structure

WHAT I LEARNED



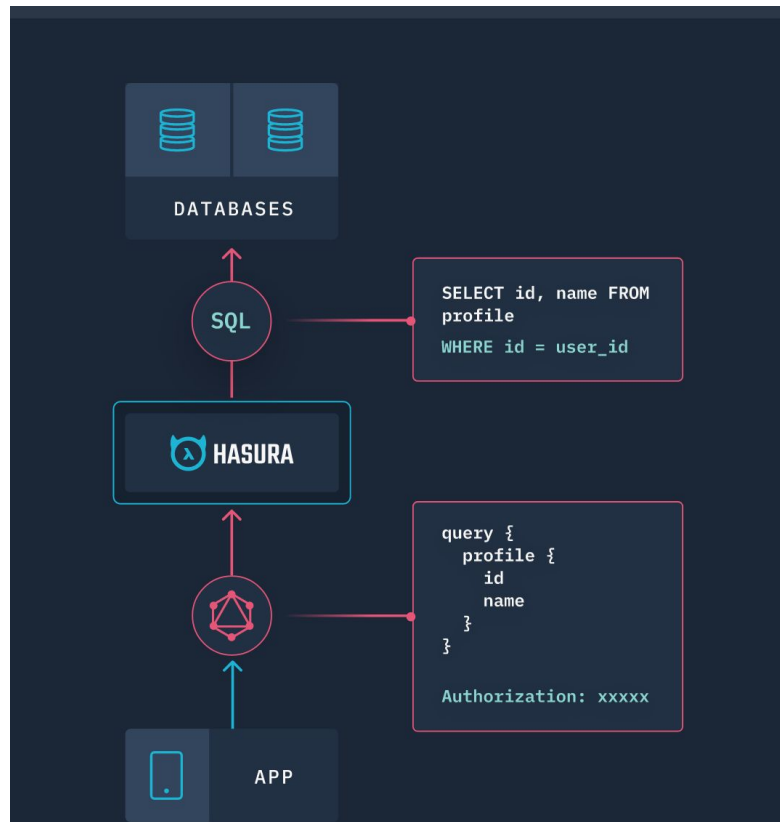
GraphQL



GraphQL - Data query and manipulation language for APIs

PostgreSQL - Relational database management system

Hasura - GraphQL engine that deploys instant, realtime GraphQL APIs on any Postgres database



HOW I CONTRIBUTED



Austin community's goal to end traffic fatalities/serious injuries

Street improvements, policy changes and education

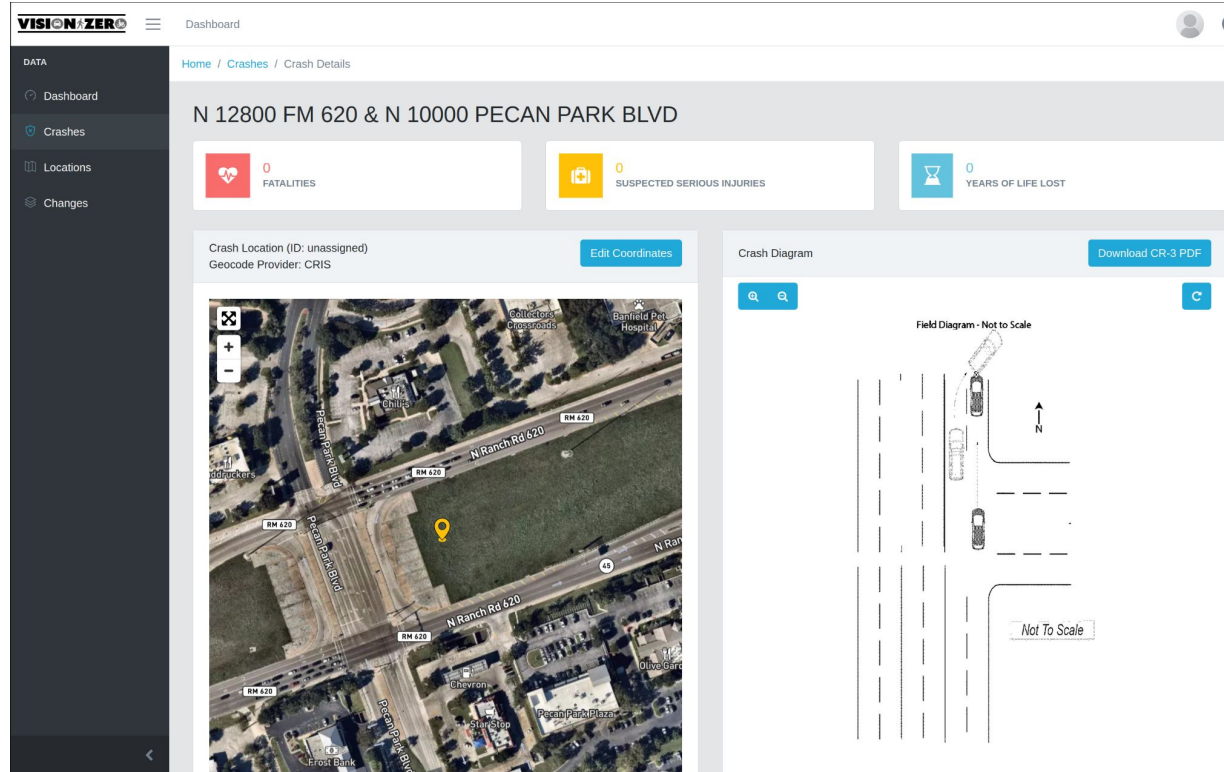
Data-driven approach

HOW I CONTRIBUTED

VISION ZERO CRASH DATABASE SYSTEM

Admin UI with detailed
crash and location
tracking

Data on mobility related
deaths and serious
injuries



HOW I CONTRIBUTED

Crash Tab Notes Feature

Goal: Internal staff would like an additional section in the current individual crash pages where thoughts and details can be conveyed about a specific crash.

HOW I CONTRIBUTED

1: Create new table for crash notes in database using Hasura Console



HASURA v1.2.1

GRAPHIQL DATA ACTIONS REMOTE SCHEMAS EVENTS PRO HELP

Schema: public

Q crash

Tables (66) Add Table

- atd_location_crash_and_cost_totals
- atd_txdot_est_comp_cost_crash_based
- atd_txdot_crash_locations
- atd_txdot_crash_locations_ranking
- atd_txdot_crash_status
- atd_txdot_crashes
- cr3_nonproper_crashes_on_mainlane
- crash_notes**

SQL

You are here: Data > Schema > public > crash_notes > Modify

crash_notes

Browse Rows Insert Row **Modify** Relationships Permissions

Add a comment

Columns

- Edit **id** - integer, primary key, unique, default: nextval('notes_id_seq'::regclass)
- Edit **created_at** - timestamp with time zone, default: now()
- Edit **updated_at** - timestamp with time zone, default: now()
- Edit **date** - timestamp with time zone, default: now()
- Edit **text** - text
- Edit **crash_id** - integer
- Edit **user_email** - text, nullable

Add a new column

column name column_type ☒ Nullable ☐ Unique default value **+ Add column**

+ Frequently used columns

HOW I CONTRIBUTED

2: Update table permissions

Permissions

✓ : full access ✗ : no access ⚑ : partial access

Role	insert	select	update	delete	
admin	✓	✓	✓	✓	
editor	✓	✓	✓	✓	<input type="checkbox"/>
readonly	✗	✓	✗	✗	<input type="checkbox"/>
<input type="text" value="Enter new role"/>	✗	✗	✗	✗	

HOW I CONTRIBUTED

3: Write GraphQL query that pulls notes for a given crash

```
export const GET_NOTES = gql`
  query FindNotes($crashId: Int) {
    crash_notes(
      where: { crash_id: { _eq: $crashId } }
      order_by: { date: desc }
    ) {
      id
      created_at
      updated_at
      date
      text
      user_email
      crash_id
    }
  }
`;
```

4. Add new Crash Notes component and display data from GraphQL response



CIVIC
INNOVATION
CORPS

HOW I CONTRIBUTED

5. Add ability to create a new note

Notes

Date	Updated By	Note
		<div><div>Enter new note here...</div><div>Add</div></div>

HOW I CONTRIBUTED

6. Add ability to edit and delete notes



DISCOVERY DAY

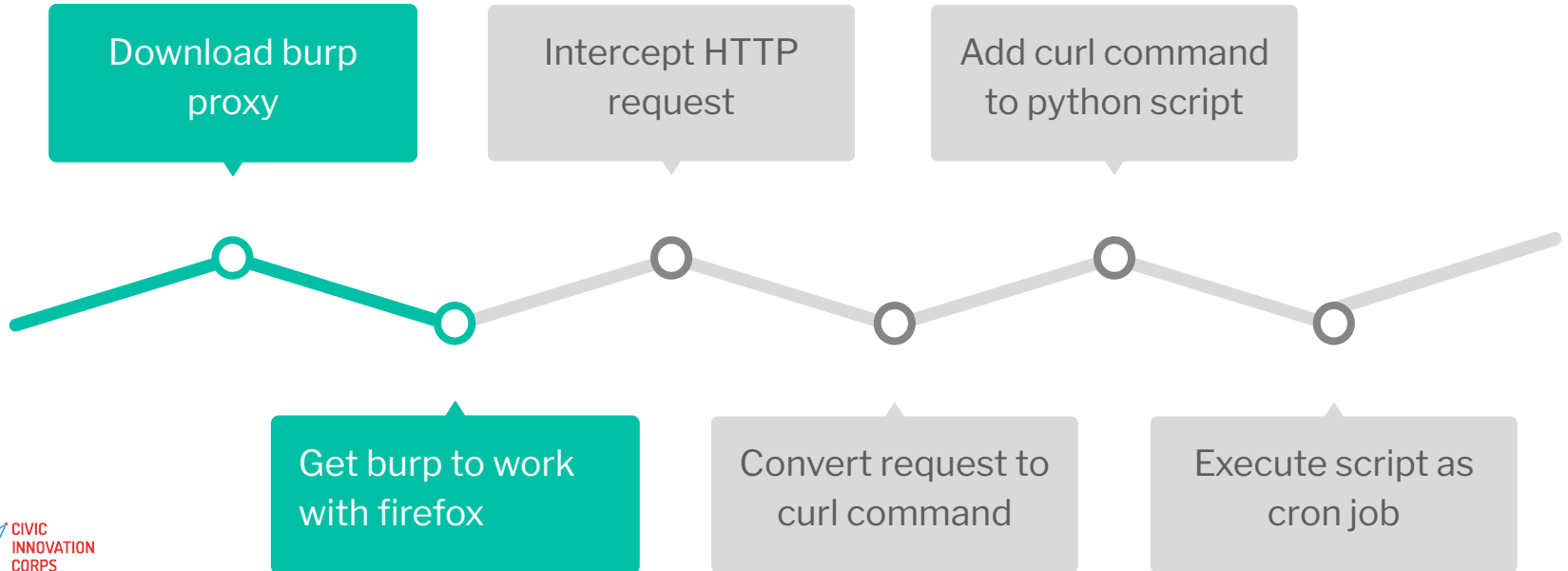
Problem: Too immersed in work to remember to clock in/out at the right times

Solution: Automation!



DISCOVERY DAY

Design




DISCOVERY DAY

Why it didn't work out :(

Justworks

Two-Factor Authentication

 **Text Message**
PREFERRED

Enter the 6 digit code sent to (***) ***-9291. It may take a minute to arrive. Didn't receive your code? [Resend code](#), [try your authenticator app](#) or [resend code via voice call](#)

☒ Remember this device for 90 days

VERIFY CODE

[Can't receive authentication codes?](#)

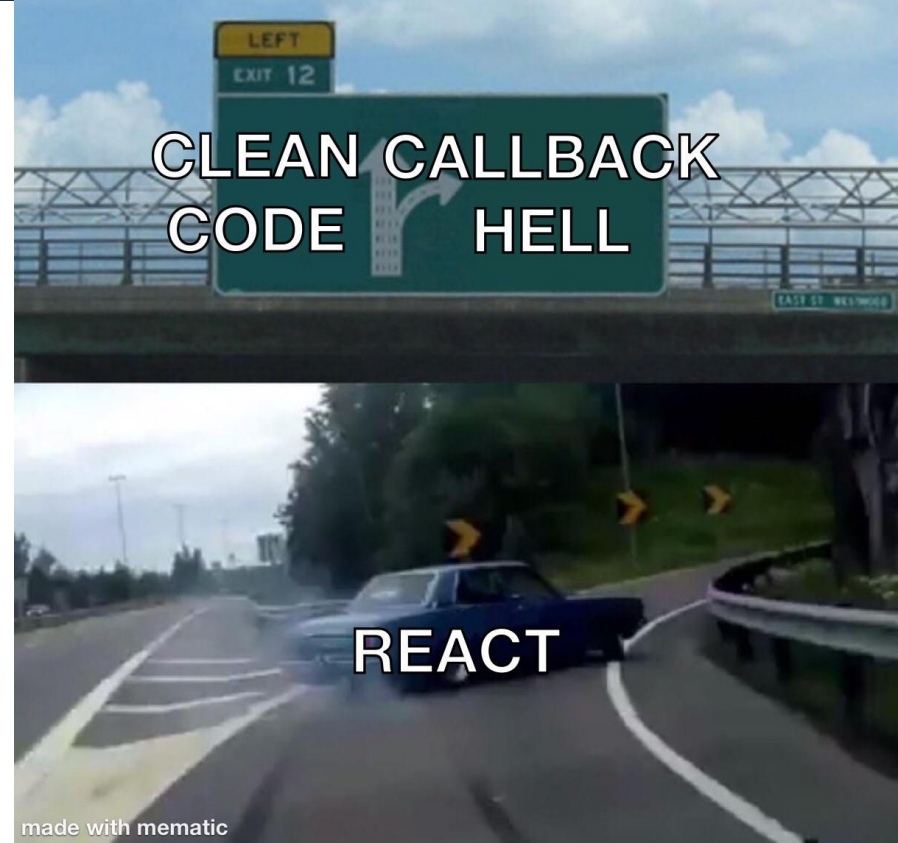
Possible solution



CHALLENGES

Zero experience in web development

Spent first few weeks learning how to use React



CHALLENGES

Becoming efficient in Git

When you're dead but remember you forgot to git commit git push your last code iterations



CHALLENGES

**Imposter syndrome +
perfectionism = PR Stress**



TAKEAWAYS

Local government attracts the purest souls

Government can be agile, flexible, and progressive

Software engineering - my dream job?

THANK YOU <3

*To everyone at ATD who gave me support and made me feel welcome
To the CIF team for this amazing opportunity
To my mentor Shayna for the guidance*



ROSE EICHELMANN
University of Texas at Austin
Sustainability Studies & Geography