Circuit Drawing Website

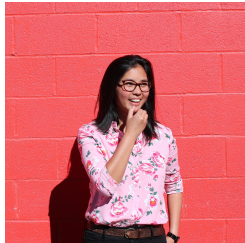**Advisor & Client:**
Dr. Andrew Bolstad

Luke Maring

Keegan McCarthy
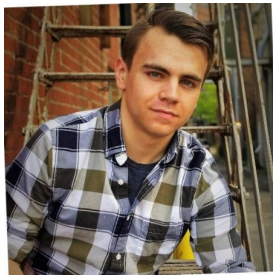
Cassie Plata

Tyler Schurk

Alex Sutton

Joe Veal

Meet the Team

Drawing Space

Cassie: front-end code leader

Tyler: front-end code designer
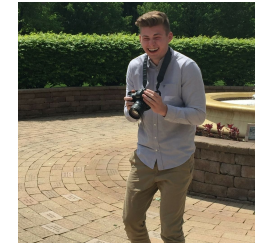
Back-end Django

Joe: back-end code leader

Alex: meeting facilitator and scribe

HTML/CSS

Keegan: team leader

Luke: report manager

Problem Statement

Our Client, Andrew Bolstad, needs a drawing tool to create circuits for use in presentations in his various classes that will be:

- Visually Appealing
- Free
- Easy to Use
- Saved
- Web-based

Use-Cases

At Iowa State, users will be able to use our website to:

- Create and download circuits for lecture slides, homework, or labs
- Learn more about circuit components
- Design circuits with peers

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Functional Requirements

- Circuit design interface with on-click

- Hosted on ISU server

- Wires that attach and move with components

- Components must have labels and values

- Schematics can be easily moved from website to local computer

- Circuits can be saved and downloaded as an image

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Non-functional Requirements

- White background

- Grid

- Help Menu

- All basic circuit components available

- Educational tab with component descriptions

Technical Considerations

Framework: Decision to use a framework to manage web development languages
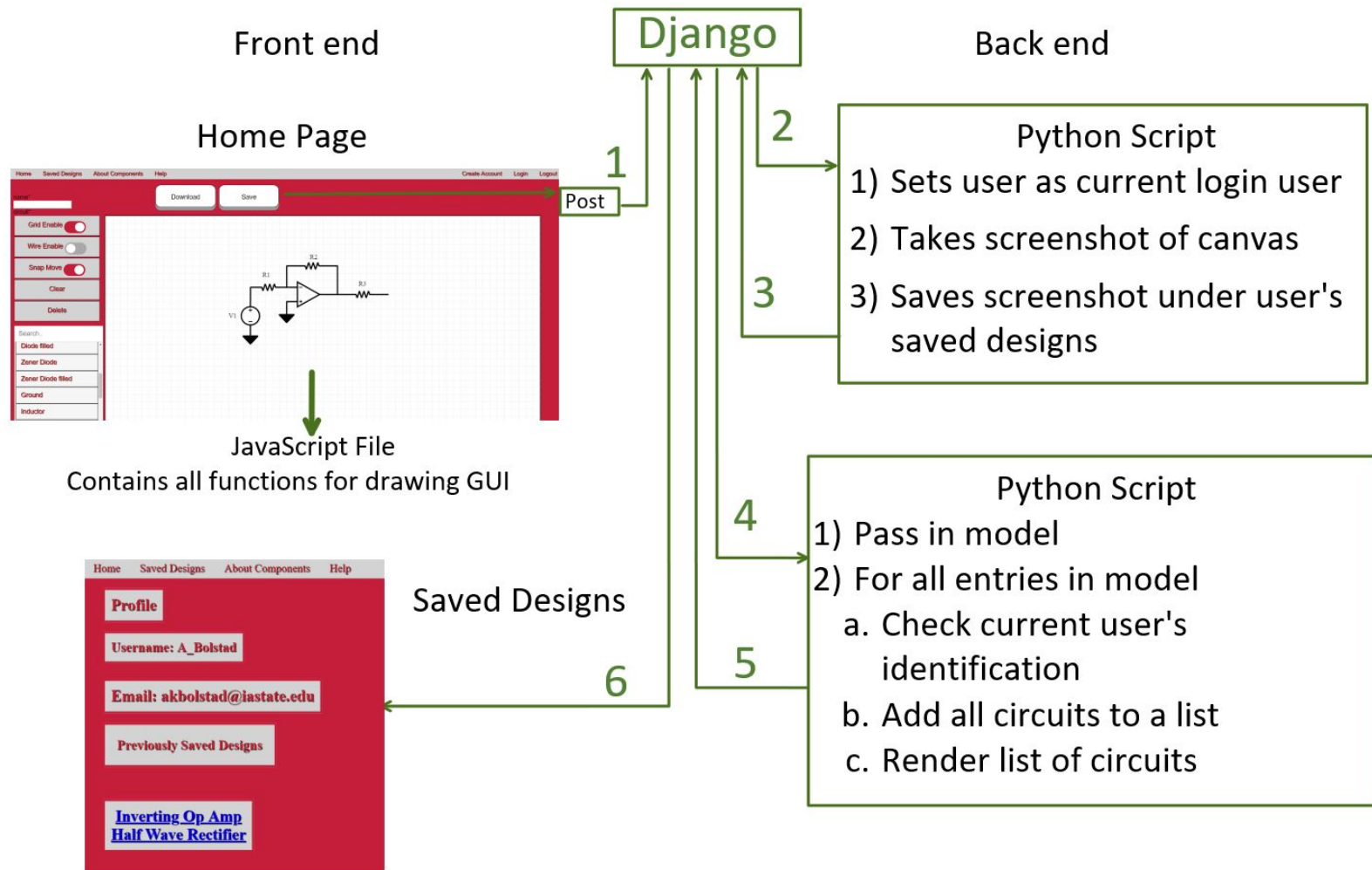
Backend:
- Swing Vs Django

Drawing Interface Tools:
- Draggable Vs jQuery Vs Fabric
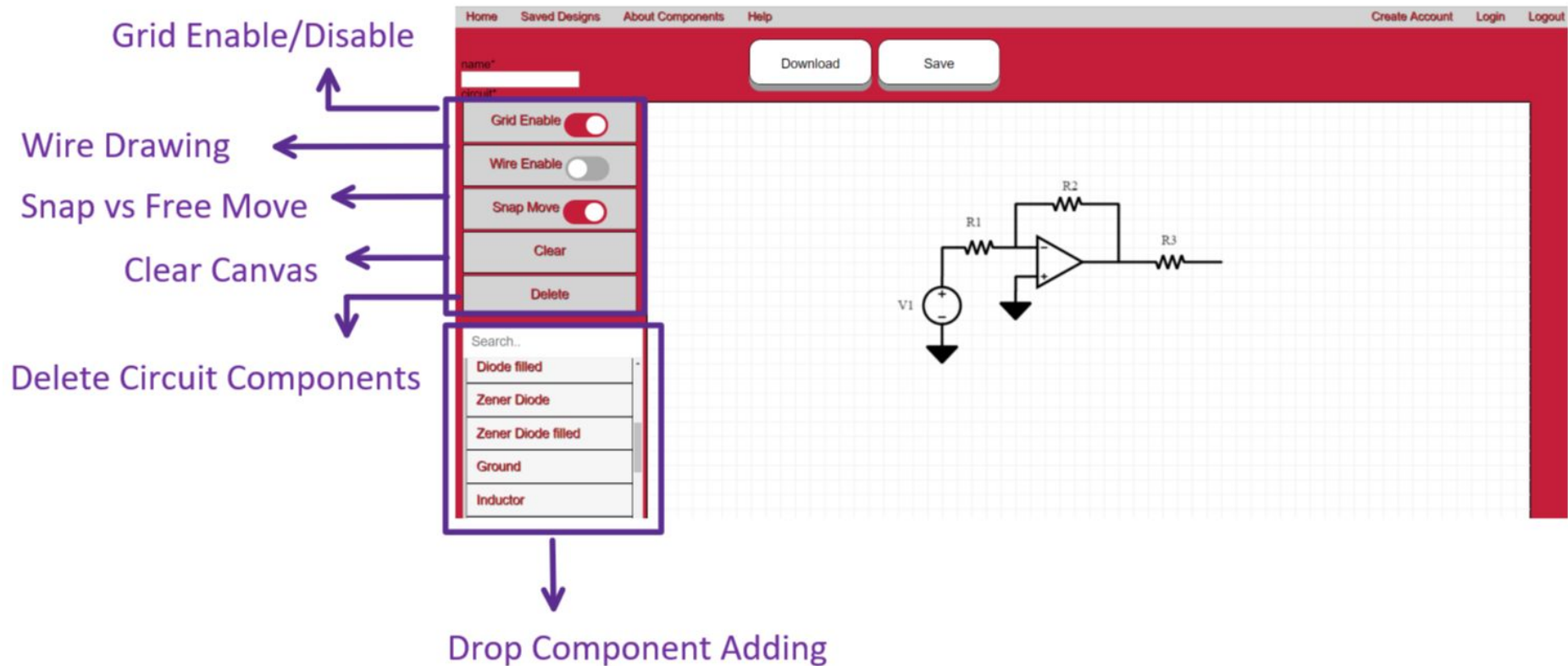
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Potential Risks & Mitigation

- Group consisting of EE Majors

- Stretch goal of simulation

- Security for website if public

System Design

Functional Decomposition

Front end

Django

Back end

Home Page

Post

1

2 Python Script
1) Sets user as current login user

2) Takes screenshot of canvas

3 3) Saves screenshot under user's saved designs

JavaScript File
Contains all functions for drawing GUI

Saved Designs

4 Python Script
1) Pass in model
2) For all entries in model
   a. Check current user's identification
   b. Add all circuits to a list
   c. Render list of circuits

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Functional Decomposition

Grid Enable/Disable

Wire Drawing

Snap vs Free Move

Clear Canvas

Delete Circuit Components

Drop Component Adding

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Technology Platforms

- Fabric.js

  - Extensive JavaScript library

- Django

  - Python-based Web Framework

- SQLite

  - Database Management System

Detailed Design

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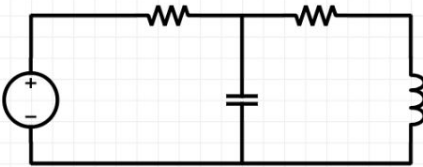
User Testing

Our client provided us with constructive feedback on possible improvements:

- Wiring
- Names and values of components
- Save feature
- User Authentication

Test Results

Overall, we met the following functional requirements for the project:

- User Authentication
- Drag and Drop
- Drawing Interface
- Routing and General Functionality
- Saving

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Feedback and Implementation Changes

- Snappable components

- Fixed grid to match components

- Labeling

- Rotation locking

- Renamed buttons

Conclusion

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Future Work to be Accomplished

- Hotkeys

- Wires dragging with components

- Component names/values

- Additional educational content

- Simulation

Video Demo

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Thank you!

Questions?