

Interactive Evaluation of Shortest Path Methods

sddec23-14

Alex Blomquist, Selma Saric,

Samuel Caldwell, and Yadiel Johnson

Project Management & Tracking Procedures

Agile Project Management Style

- Weekly breakdowns on upcoming assignments and goals
- Retrospectives after each spring to reflect on team progress and performance
- GitLab version control during the implementation phase of the project

Task Decomposition

1 Design the *System Architecture*

- 1.1 Design the server component
- 1.2 Design the driver component
- 1.3 Design the web app component
- 1.4 Adjust and adapt the algorithm-dataset suite

2 Design the *System Framework*

- 2.1 Design a standardized format for algorithm I/O
- 2.2 Design the REST endpoints

3 Design *Testing Framework*

4 Finalize Design Document

5 Prepare Server Environment

6 Implement Server Component

- 6.1 Add REST endpoints
- 6.2 Implement persistence

7 Implement Driver Component

- 7.1 Implement algorithm interface solution
- 7.2 Add “runtime and space complexity” metric gathering

8 Implement Web App Component

- 8.1 Implement basic UI
- 8.2 Add REST logic
- 8.3 Add user form submission
- 8.4 Implement algorithm output visualization
- 8.5 Add “comparison export” functionality

9 Implement Testing Suite

10 Final Presentation

Task Decomposition

Backend

- Obtain and adapt implementations of various SP algorithms
 - Modify algorithm implementations such that all I/O operations are standardized
- Develop an “algorithm execution driver”
- Develop a server component that manages RESTful transactions
 - Integrate with the driver to coordinate multiple algorithm executions
- Implement methods to receive, validate, and manage datasets submitted by users

Task Decomposition

Frontend

- Create wireframes for the entirety of the web application to conceptualize its user interface.
- Create UI for the web app using HTML, CSS, and JavaScript
 - Develop a way for users to upload data sets.
 - Develop a way for the users to select algorithm(s) to run on their data sets.
 - Develop shortest-path algorithm visualizations.
- Present algorithm runtime and metrics on the results screen.
 - Develop a method to generate reports that have comparisons between algorithms, including a method to store them.

Milestones

Milestone

Metrics:

Finalize System Architecture Design

(April 2nd)

Develop Server and Driver Components

(Oct. 1st/Sept. 17th)

Unit testing

(Oct. 17th)

Implementation of Algorithm Visualization

(Nov. 1st)

Develop User Interface

(Nov. 11th)

Integration and Acceptance Testing

(Nov. 17th)

Final Software Release and Presentation to Panel

(Dec 3rd/Dec. 8th)

Project Timeline

Semester 1

Phase 1: Research and Planning

Discover Phase Research	2/14/23	2/14/23
TeamThink Constellation	2/14/23	2/14/23

Phase 2: Documentation

Team Initiation Assignment	2/14/23	2/19/23
Professionalism Assignment	2/20/23	2/26/23
Requirements, Constraints, and Engineering Standards	2/27/23	3/5/23
SD Team Website V1	3/6/23	3/12/23
Project Plan Assignment	3/13/23	3/26/23
Design Assignment	3/27/23	4/2/23
Testing Assignment	4/3/23	4/9/23
SD Team Website V2	4/10/23	4/23/23

Phase 3: Finishing Up

Final Design Document	4/10/23	4/23/23
Faculty Panel Presentation	5/3/23	5/3/23

Project Timeline

Semester 2

Sprint 1: Forming Frontend and Backend

Wireframe Web App Pages	8/24/23	9/3/23
Create Home Page	9/4/23	9/17/23
Develop Algorithm Selection	9/4/23	9/10/23
Create Ability to Upload Data Set	9/11/23	9/17/23
Develop Server Controller & Persistence	8/24/23	9/10/23
Develop Server REST Logic	9/11/23	9/17/23
Unit Testing	9/18/23	9/30/23

Sprint 2: Algorithm Implementation and Visualization

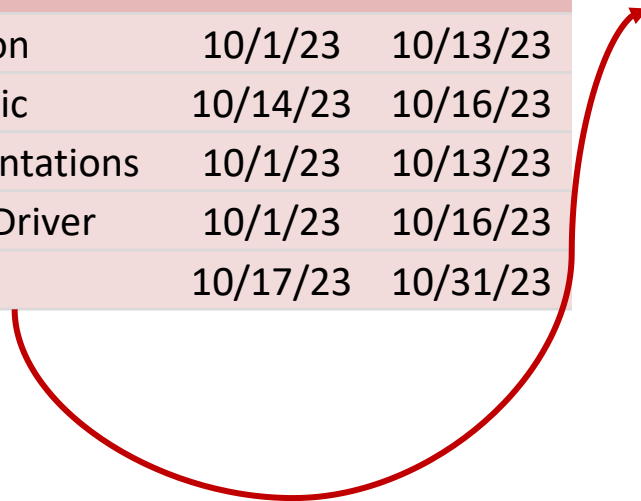
Develop Algorithm Visualization	10/1/23	10/13/23
Implement Web App REST Logic	10/14/23	10/16/23
Aggregate Algorithm Implementations	10/1/23	10/13/23
Develop Algorithm Execution Driver	10/1/23	10/16/23
Unit Testing	10/17/23	10/31/23

Sprint 3: Establishing Communication Between Frontend and Backend

Connect Algorithms to Visualizer	11/1/23	11/6/23
Display Algorithm Runtime	11/7/23	11/11/23
Create Report Generation and Storage	11/12/23	11/17/23
Unit Testing	11/17/23	12/3/23

Sprint 4: Wrapping Up

Final Presentation to Panel	12/4/23	12/8/23
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Risks & Mitigation Plan

Task #	Task	% Risk	Reasoning
7	Implement Driver Component	.5	Implementation Failure

Mitigation Strategy

Verify algorithm results using a variety of data sets, each with unique properties.

Personnel Effort

#	Title	Hours
1	Design System Architecture	30
2	Design System Framework	30
3	Design Testing Framework	40
4	Prepare Server Environment	40
5	Finalize Design Document	20
6	Implement Server Component	50
7	Implement Driver Component	50
8	Implement Web App Component	50
9	Implement Testing	40
10	Final Presentation	100