AgeWell

Mapping the way to a healthy future

Team 043: Yuan, Fabien, Danjie

2 : Yuan Sui

Itinery

00
CORE MESSAGE

01
USABILITY

02
RESPONSIVENESS

03
PATHFINDING

04
COURIER PLANING

05
PITCH

06
CONCLUSION

3 : Yuan Sui

00

Core Message

4 : Yuan Sui

Create a GIS that is tailored to meet the unique needs of seniors

5 : Yuan Sui

Google Maps are Hard for John [1]

Minimize sequence of clicks

I forgot the procedures to use the INTERFACE

The TEXT IS TOO SMALL for me

Bigger text

Calorie, Walking Distant, Real time Weather

I can't find INFORMATION I want

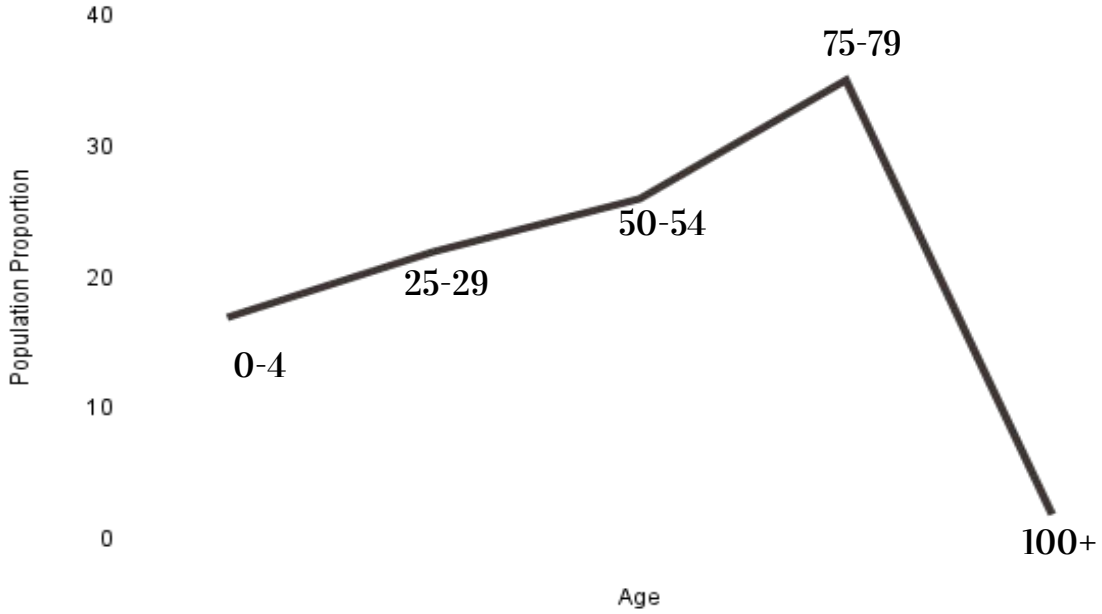
Hospitals, Parks, Grocery stores

These texts and icons DISTRACTS me

Less text and icons on screen

[1]Ja Eun Yu, and Debaleena Chattopadhyay, "Maps are hard for me: : Identifying How Older Adults Struggle with Mobile Maps," *Proceedings of the 22nd International ACM SIGACCESS Conference on Computers and Accessibility*

Ageing Population[2]



In 2050

80% of senior
Third-world countries
[3]

7 : Fabien Zhao

01

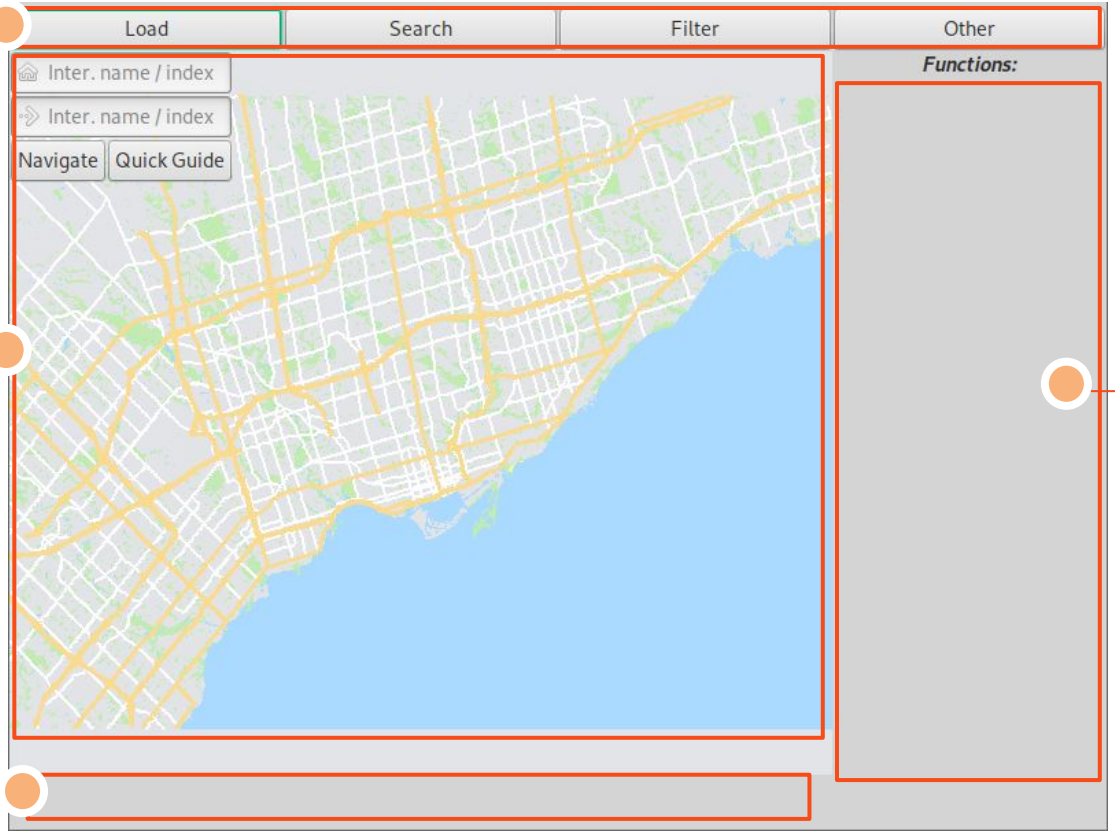
Usability

Interface Overview

Tool Bar

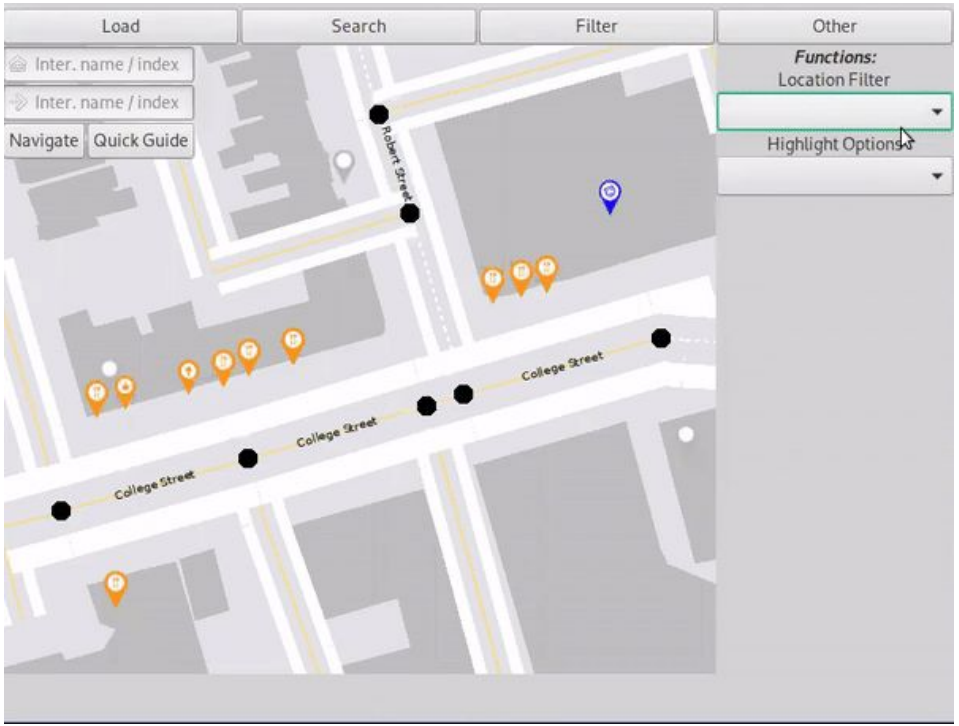
Map Display

Status Bar



Side Panel

Location Filter Help Find Desired Information



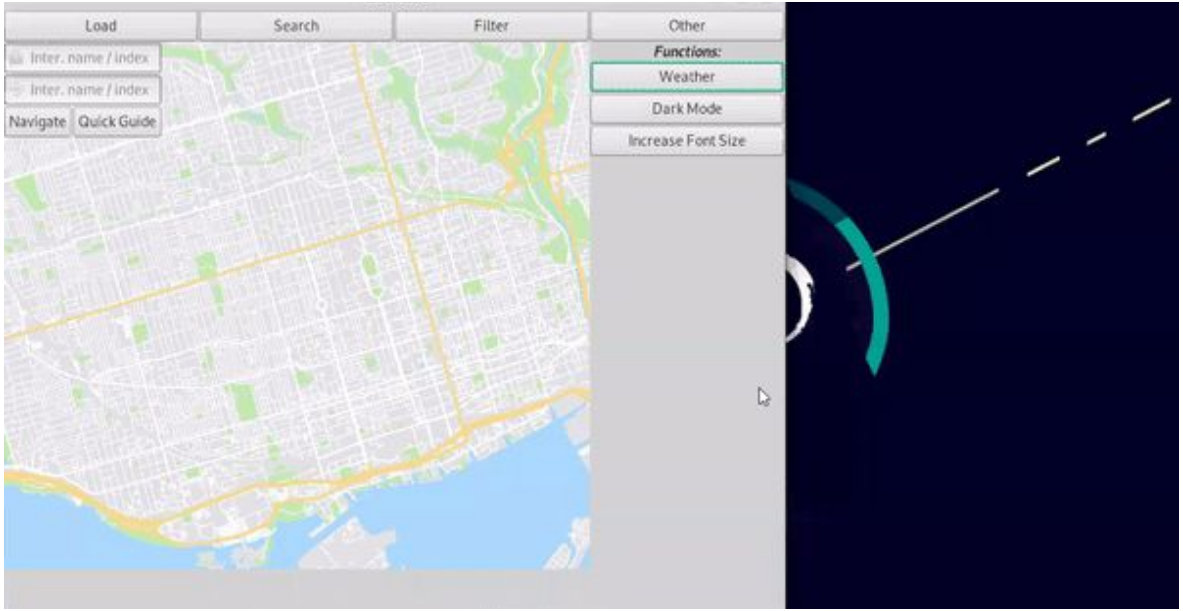
Procedure:

1. Filter
2. Dropdown Menu
3. Choose your filter option

~ 3 clicks

10 : Fabien Zhao

Weather Information Help Plan Daily Activities

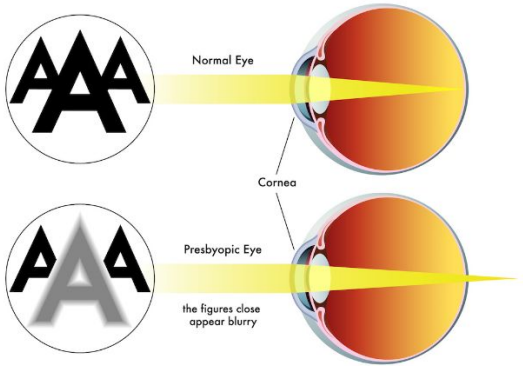


Procedure:

1. Other
2. Weather Button

~ 2 clicks

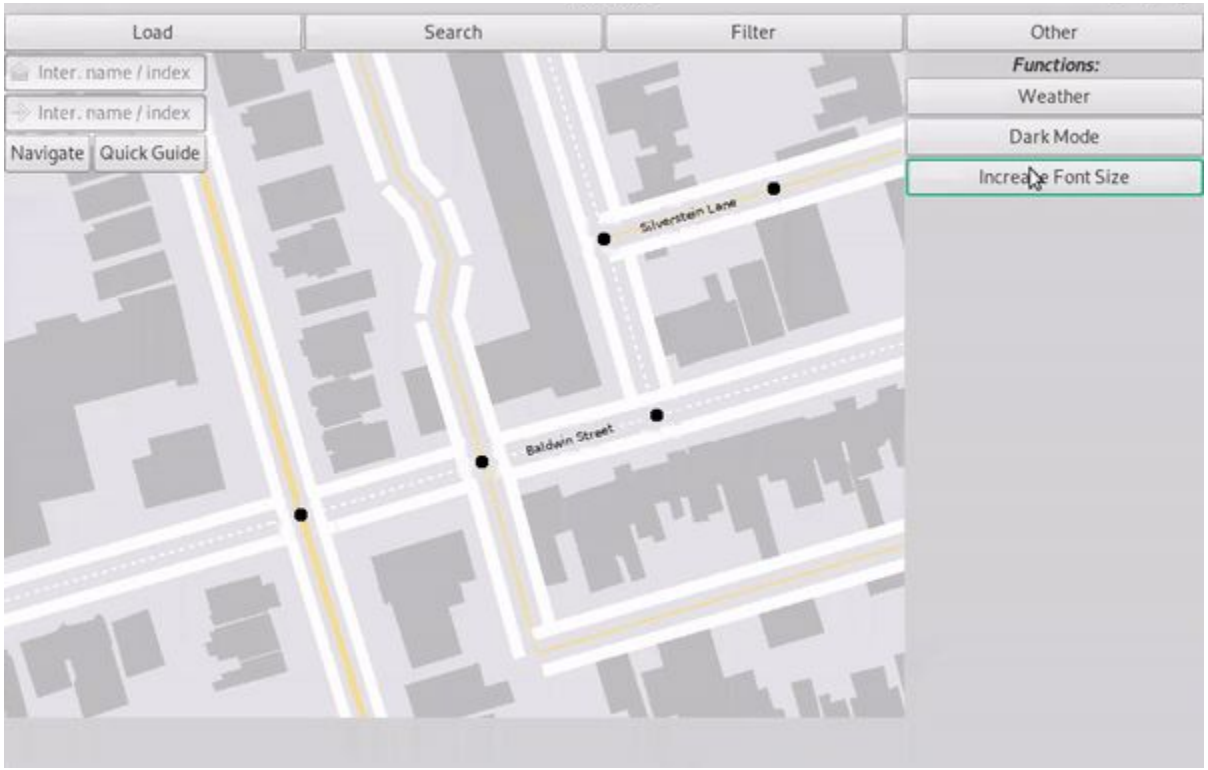
Larger Font Size Improves Readability



Over **80%** of adults aged 45 years old or older diagnosed with **Presbyopia** [4]

12 : Fabien Zhao

Larger Font Size Improves Readability



Procedure:

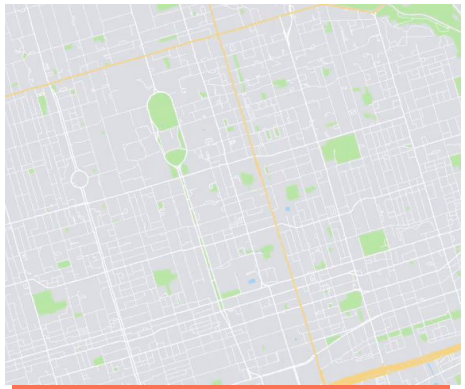
1. Other
2. Change Font Size Button

~ 2 clicks

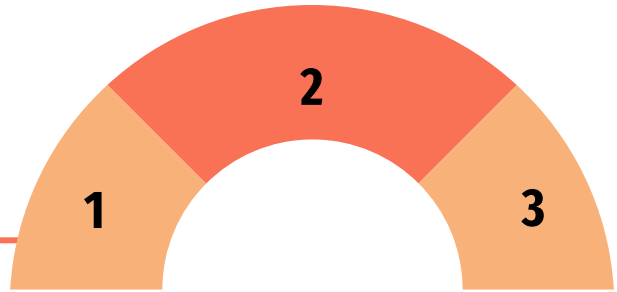
02

Responsiveness

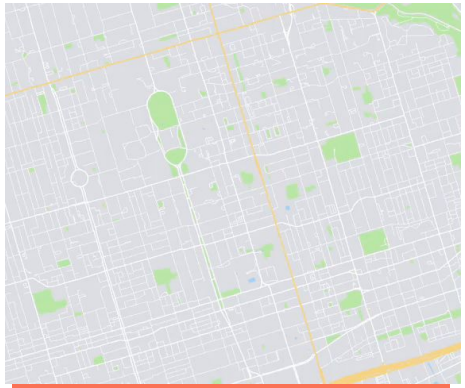
High Frame Rate



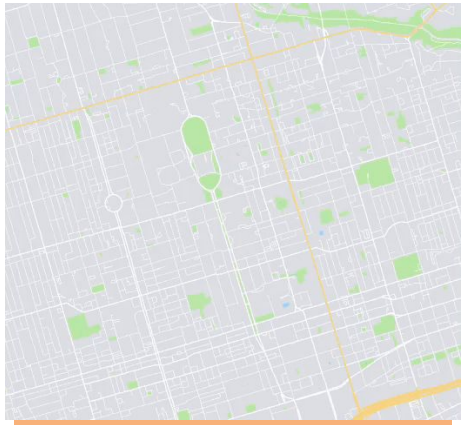
M2



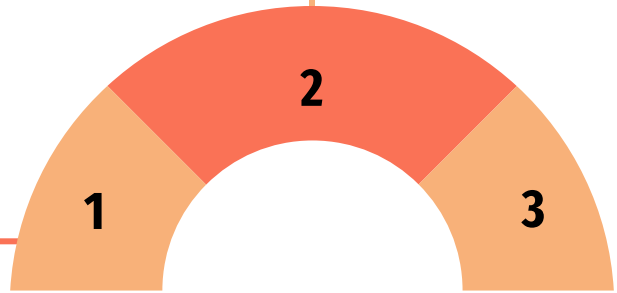
15 : Danjie Tang



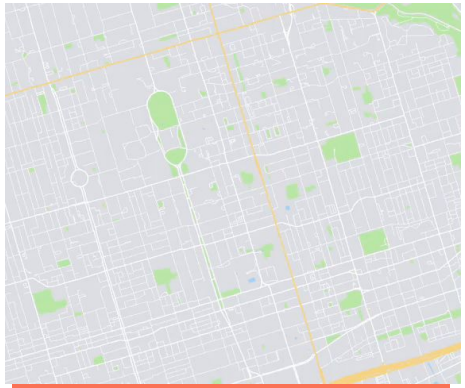
M2



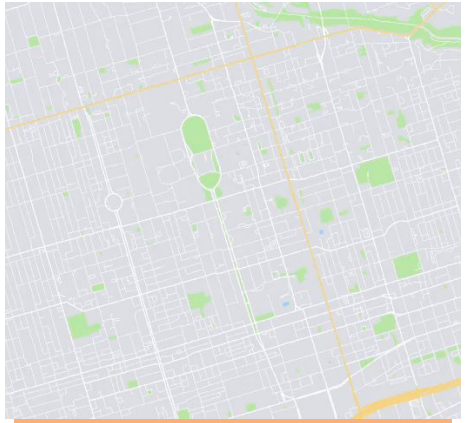
Lots of Optimization



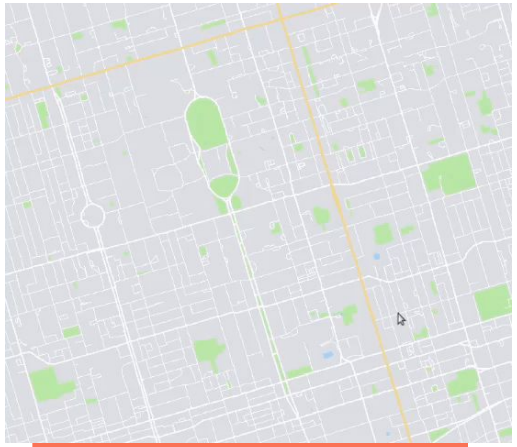
16 : Danjie Tang



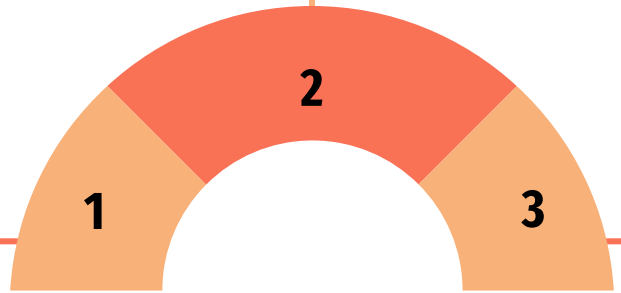
M2



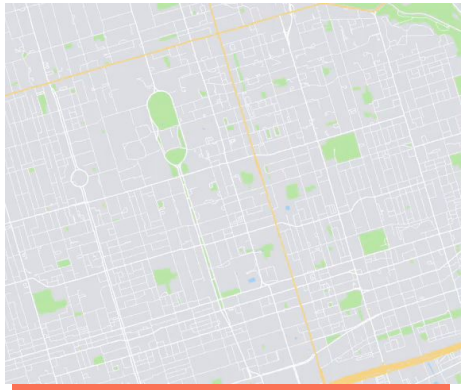
Lots of Optimization



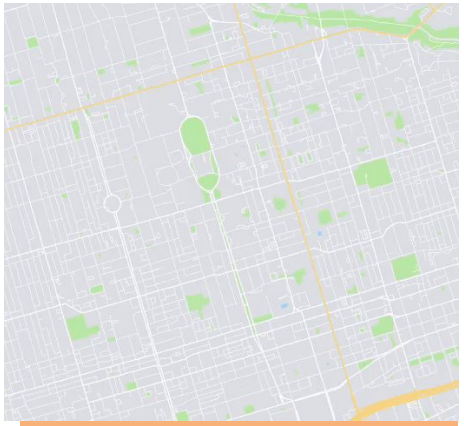
R-Tree Data Structure



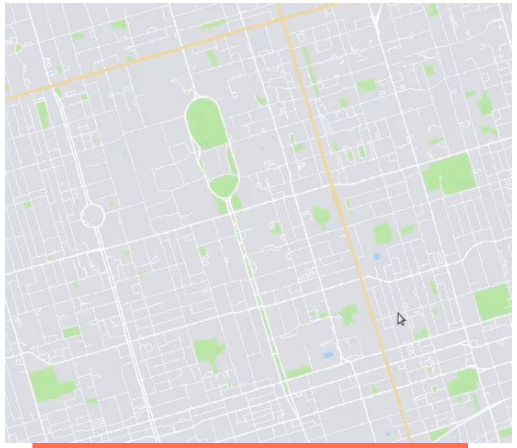
17 : Danjie Tang



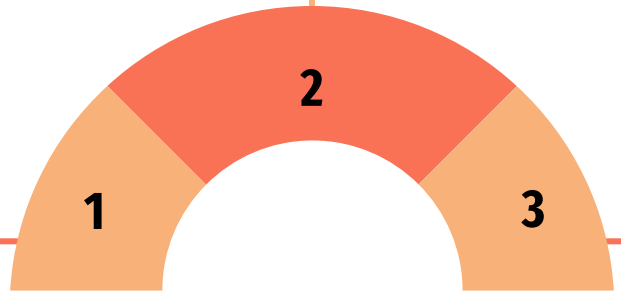
11 FPS



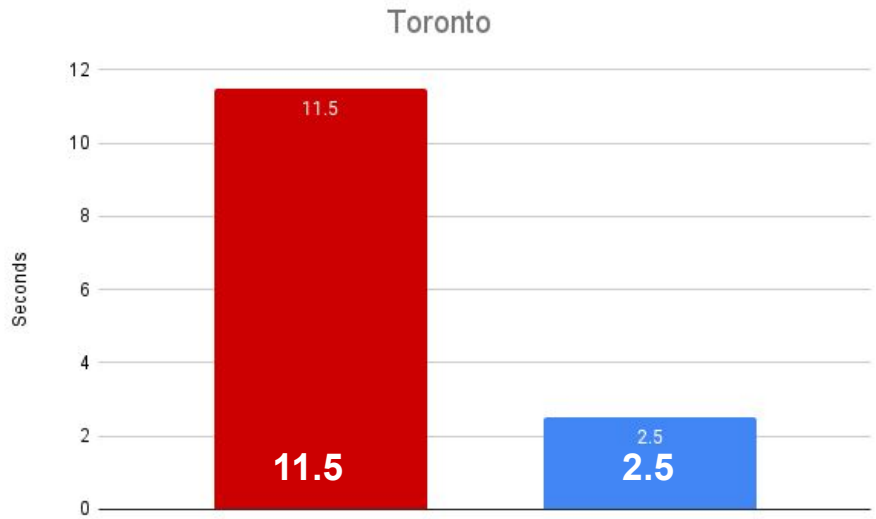
27 FPS

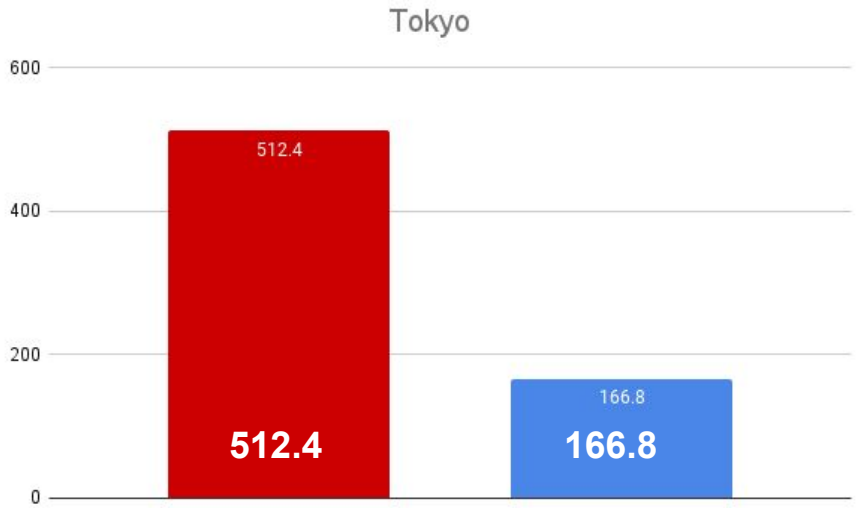


76 FPS



Blazing Fast Loading Speed





Performance Stats

	Responsiveness	Usability
Live Weather	<0.5s	2
Path Finding	<0.1s	4
Larger Font	<0.4s	2

03

Path Finding

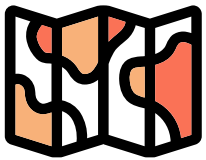
Path Finding Algorithms

Dijkstra's Algorithm

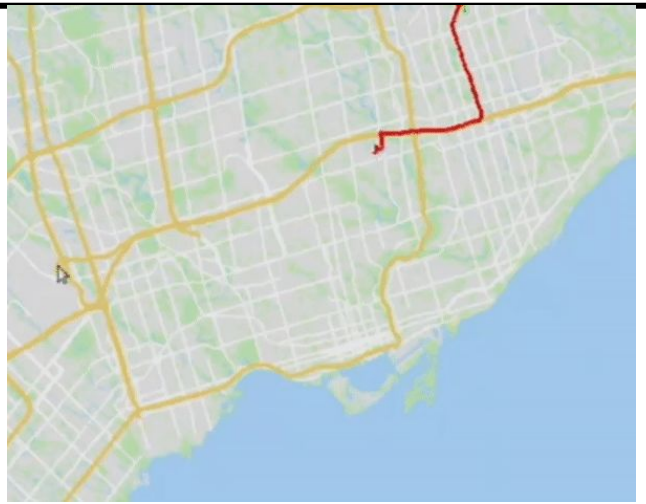
Guaranteed Shortest Path

A* Algorithm

Fast Speed



[5]



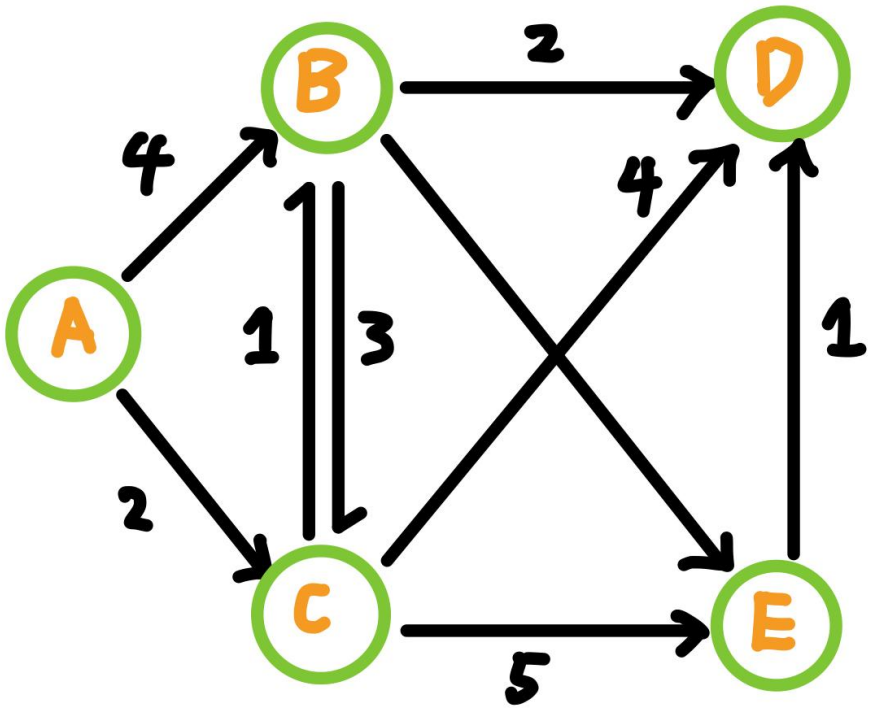
[6]

Dijkstra's Crash Course

Travel

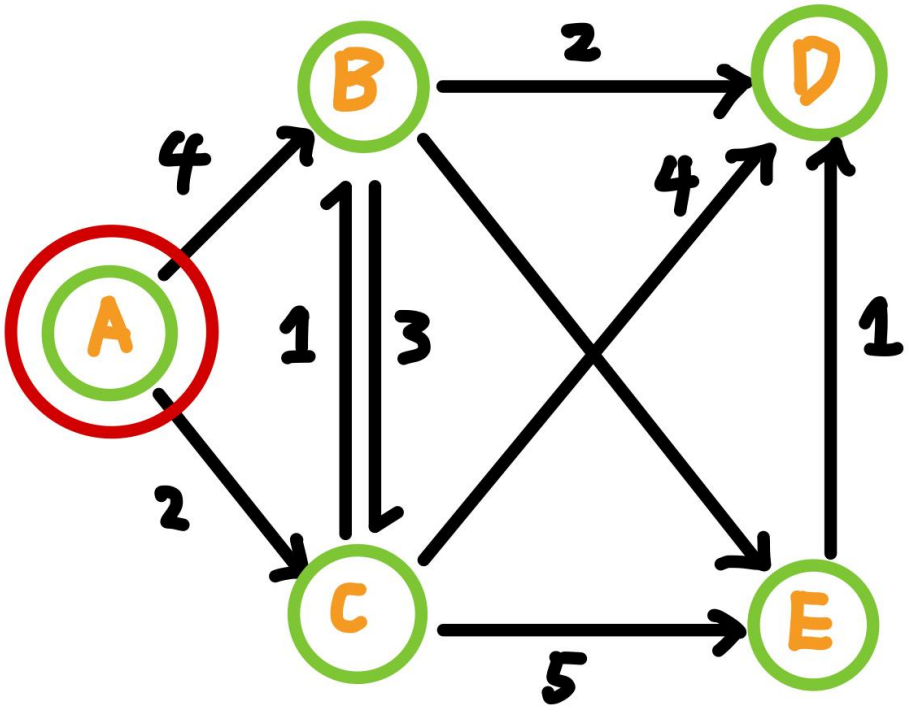
Find Neighbor

Dijkstra's Crash Course



- Visited
- In Heap

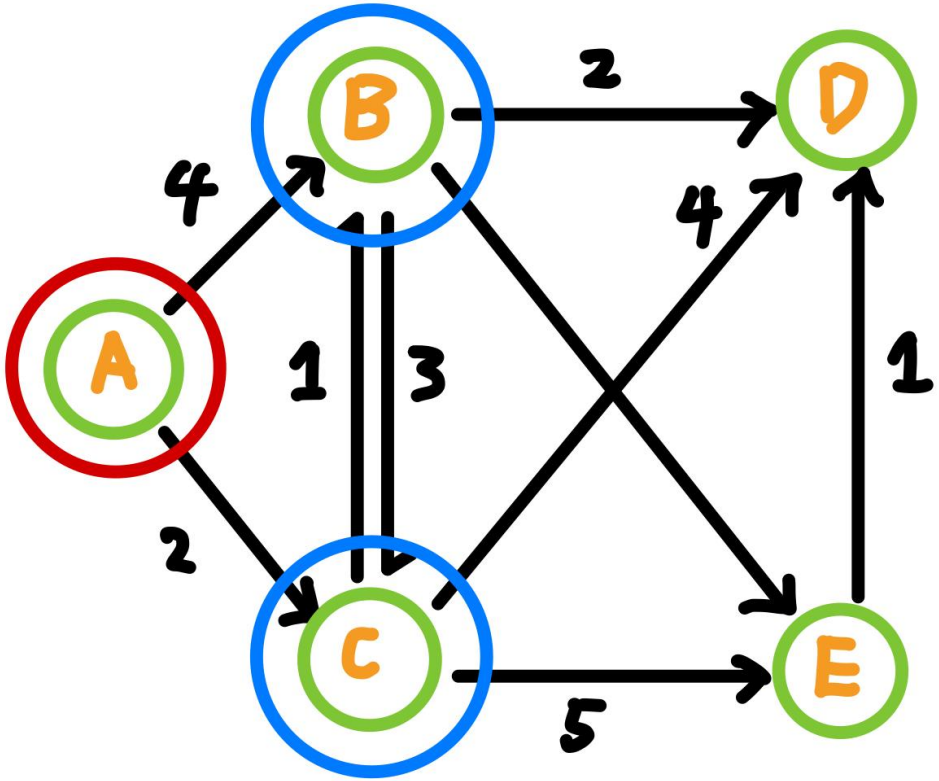
Dijkstra's Crash Course



Visited

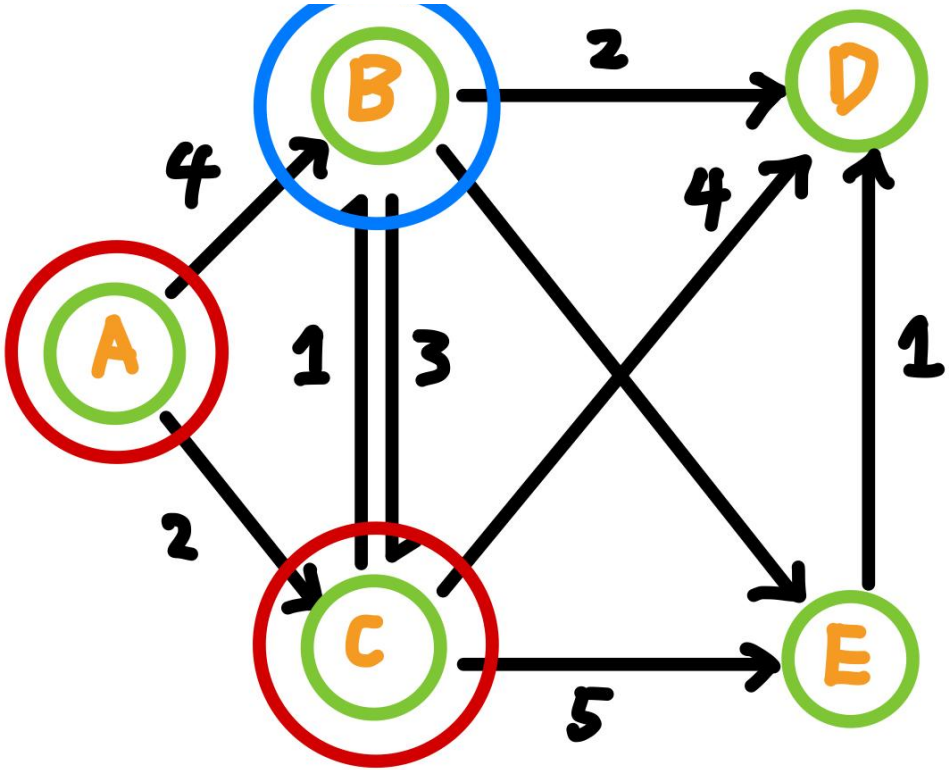
In Heap

Dijkstra's Crash Course



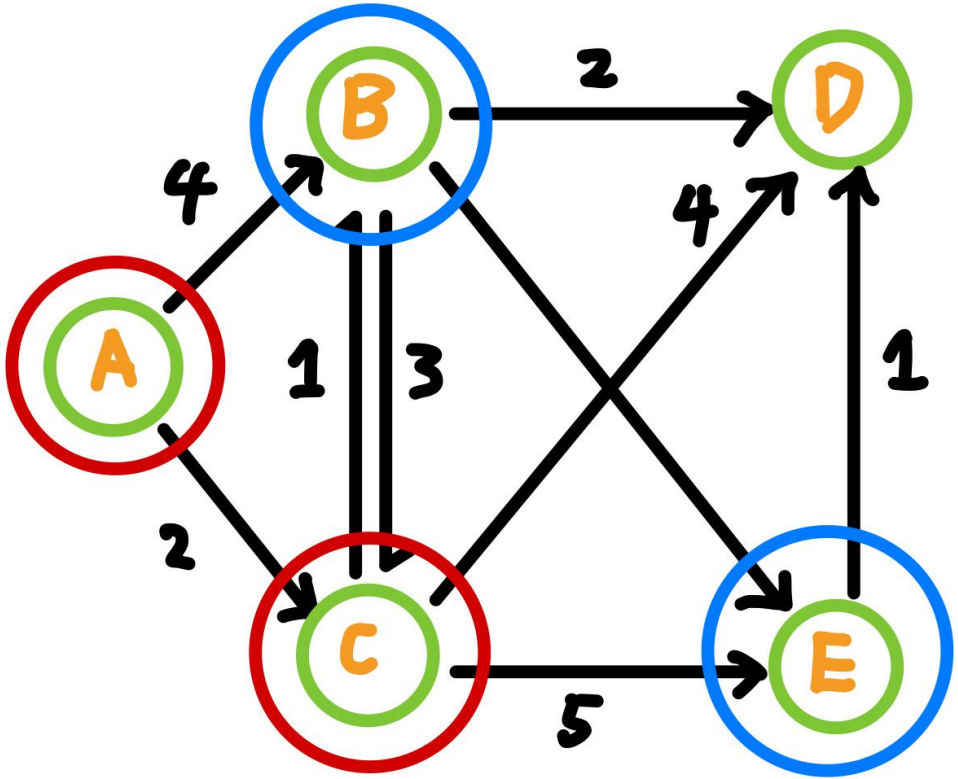
- Visited
- In Heap

Dijkstra's Crash Course



- Visited
- In Heap

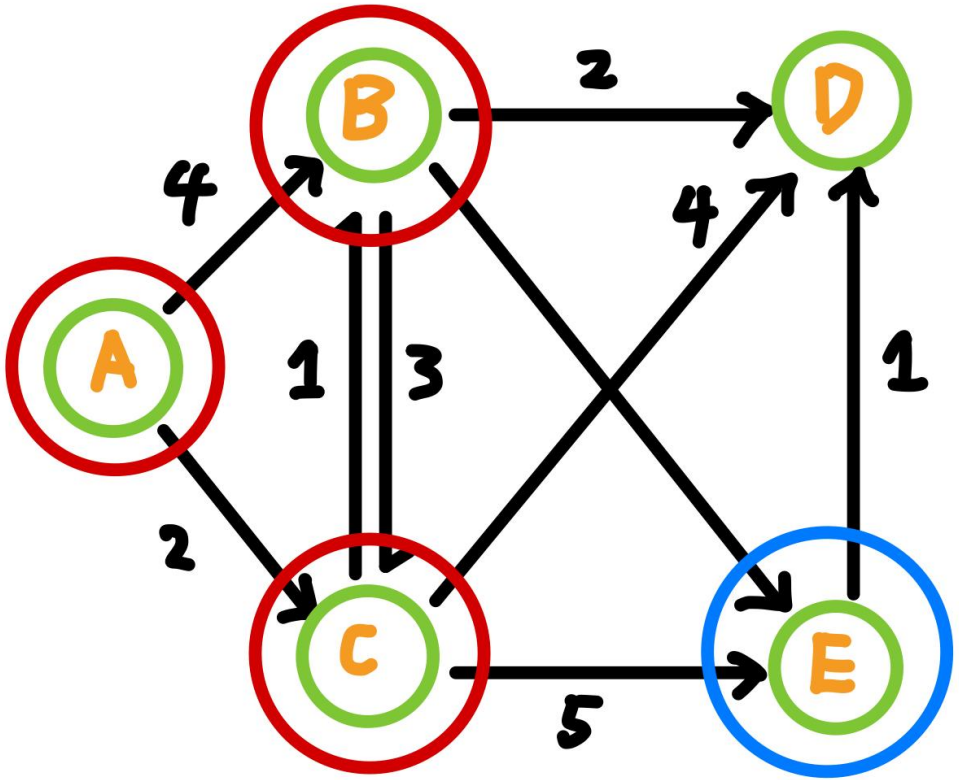
Dijkstra's Crash Course



Visited

In Heap

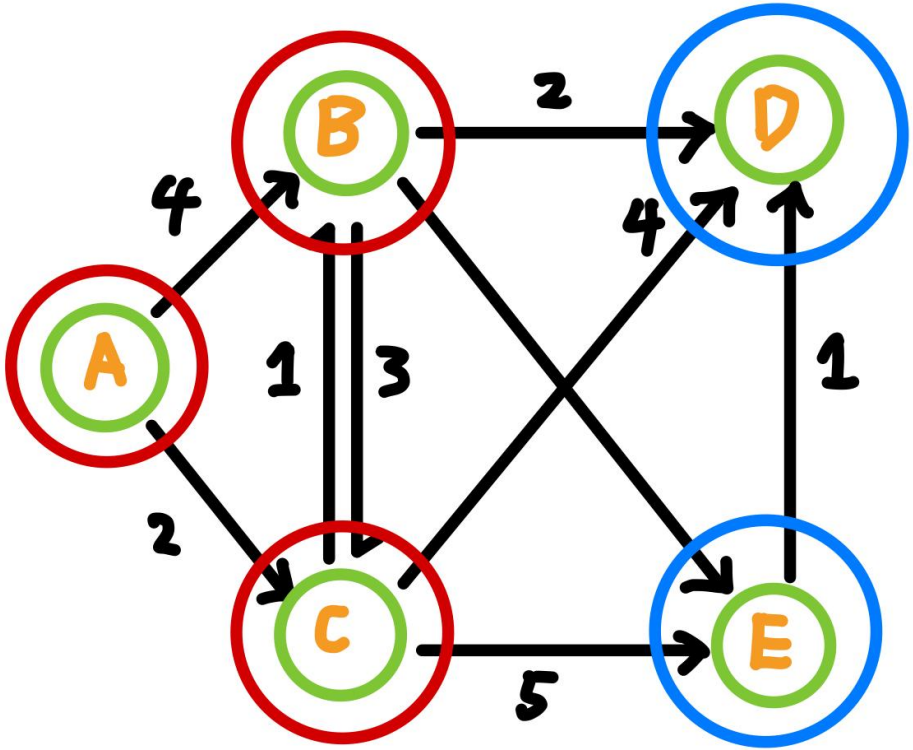
Dijkstra's Crash Course



Visited

In Heap

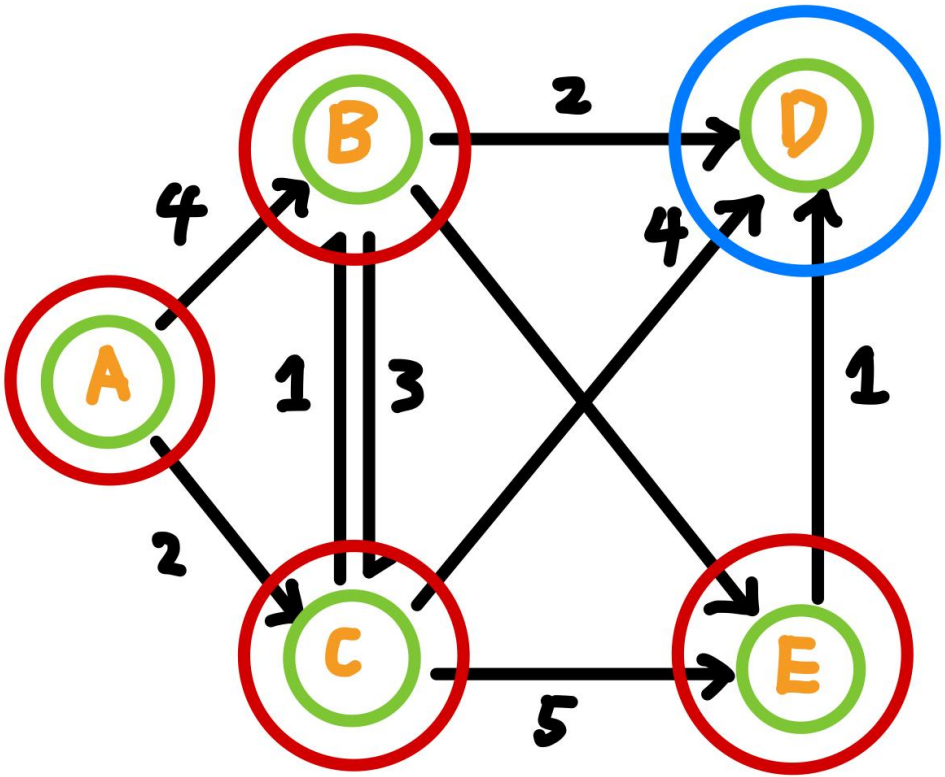
Dijkstra's Crash Course



Visited

In Heap

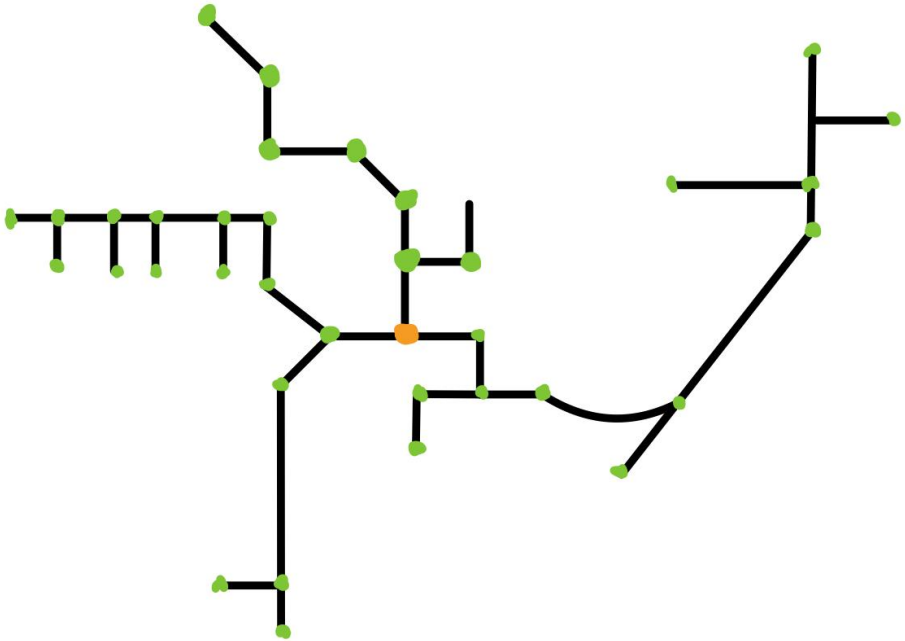
Dijkstra's Crash Course



Visited

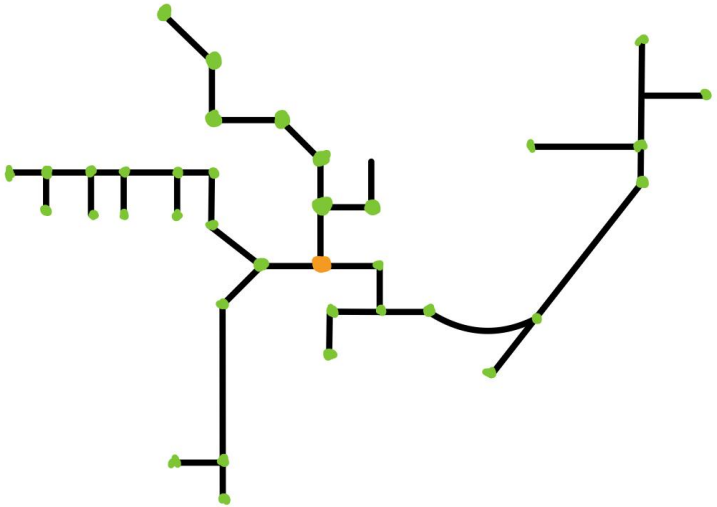
In Heap

Consider This Case



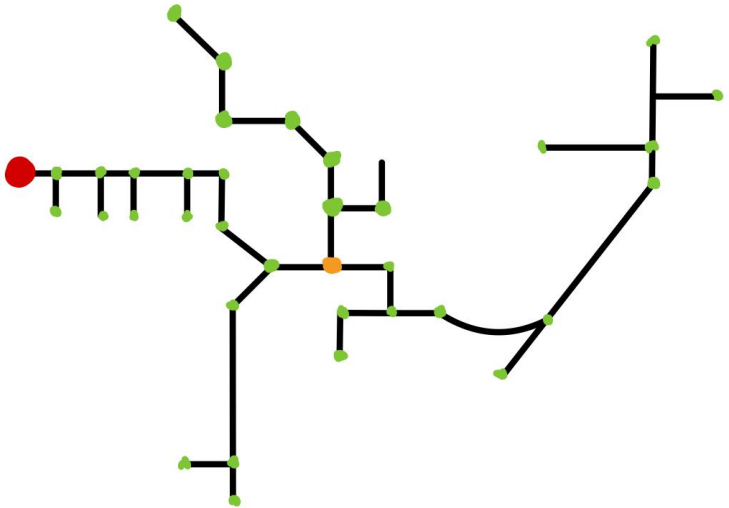
Consider This Case

- Destination

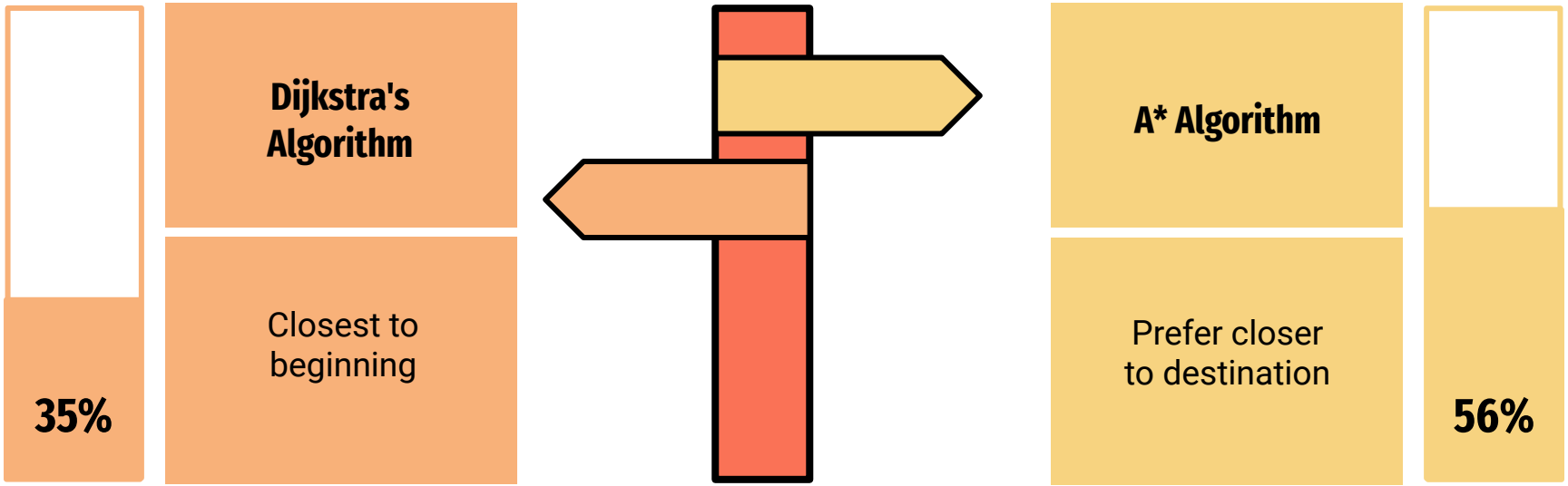


Consider This Case

Destination

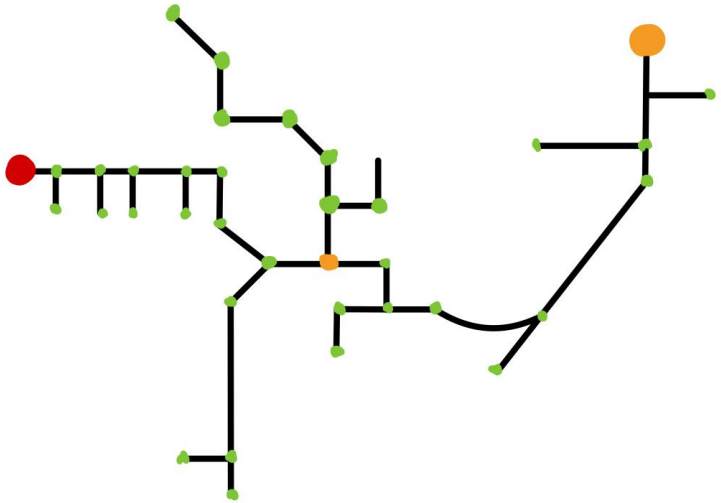


A* Algorithm


35%
Dijkstra's Algorithm
Closest to beginning
A* Algorithm
Prefer closer to destination
56%

Consider This Case

- Destination

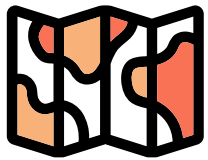


Path Finding Algorithms

Dijkstra's Algorithm

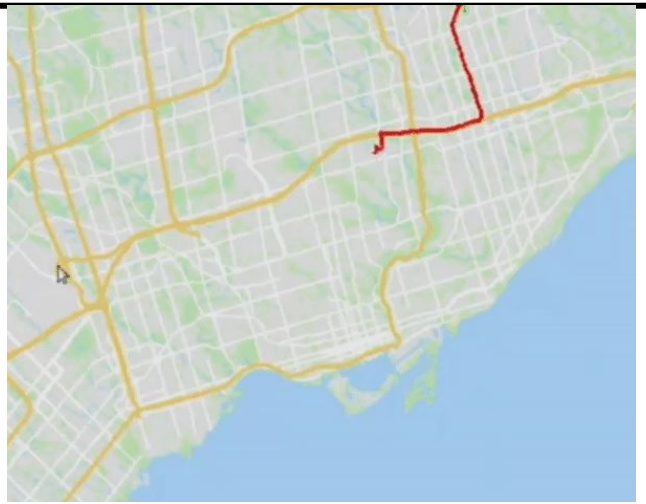
Guaranteed Shortest Path

[5]



A* Algorithm

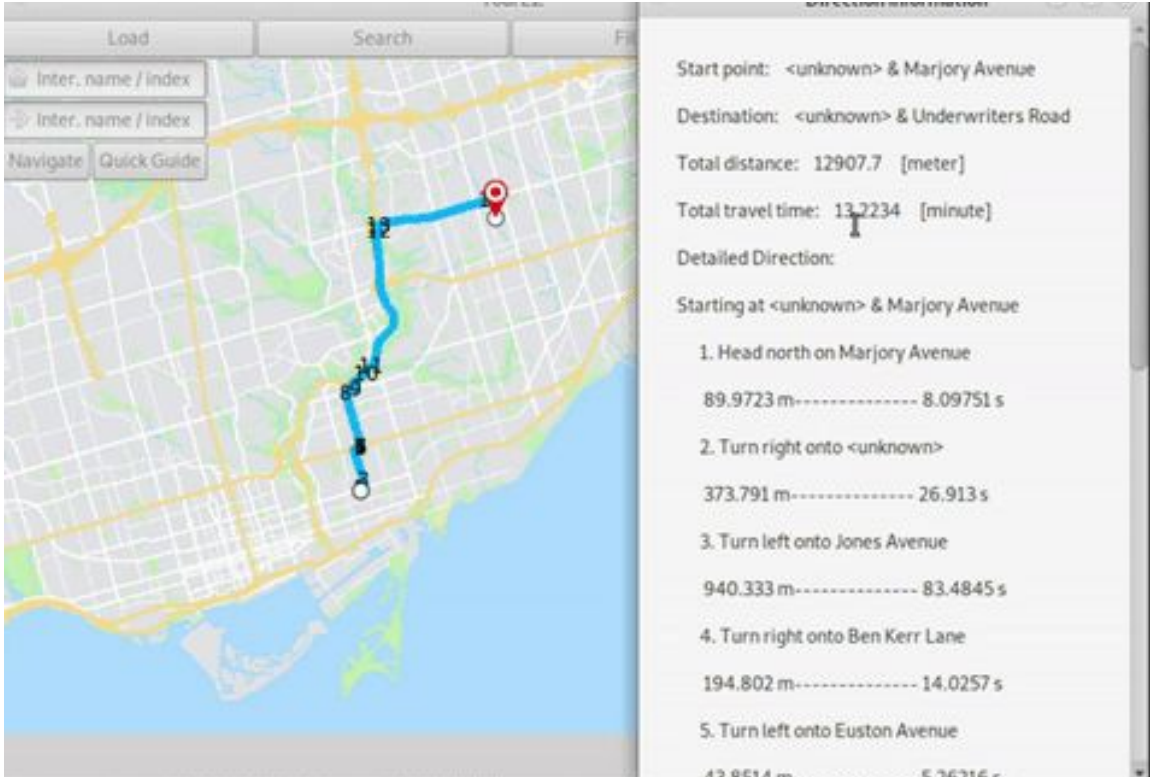
Fast Speed



[6]

37: Danjie Tang

UI Demo



04

Courier Planning

1

Greedy Algorithm

Provide a good initial solution

2

Randomization

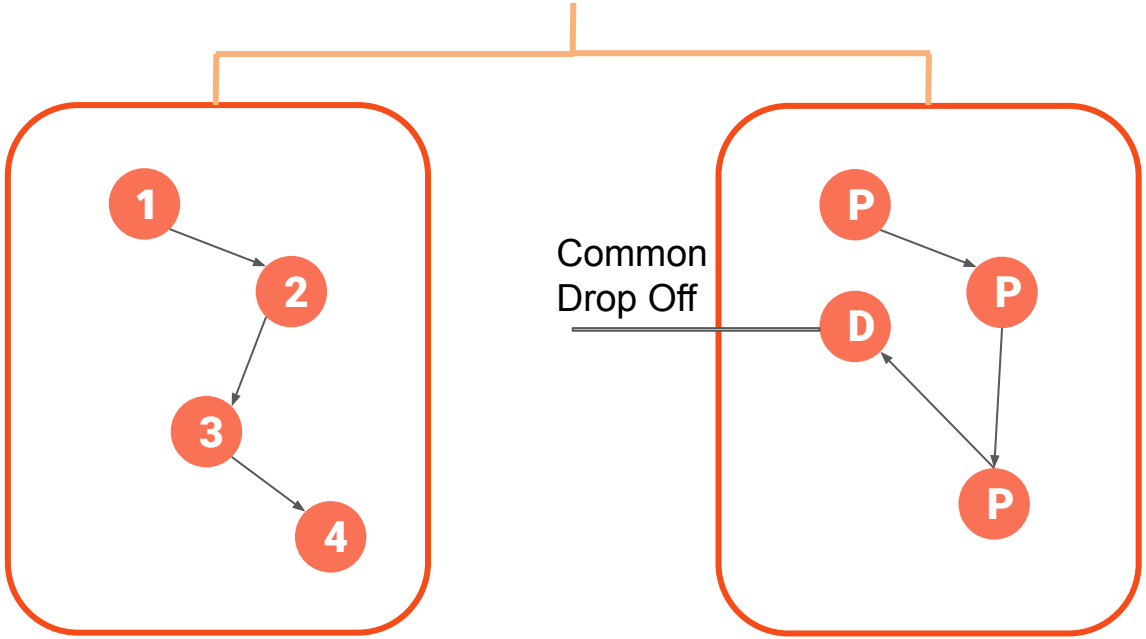
Improve solution by making small changes

3

Simulated Annealing

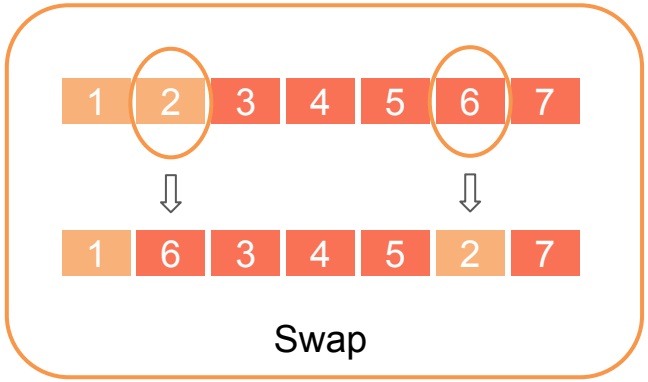
Explore search space

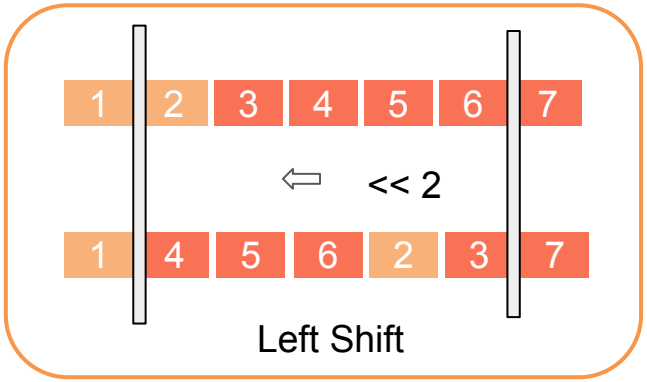
Greedy Algorithm

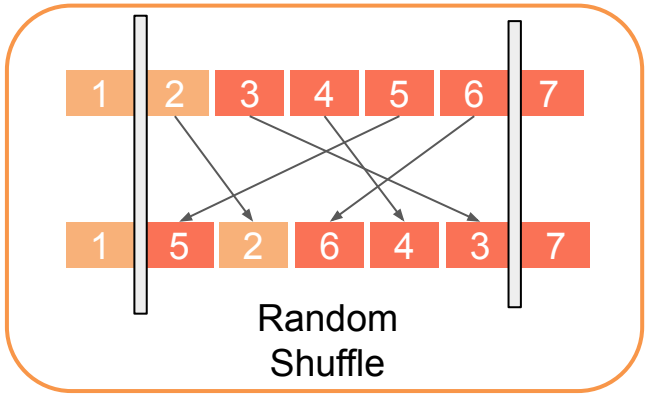


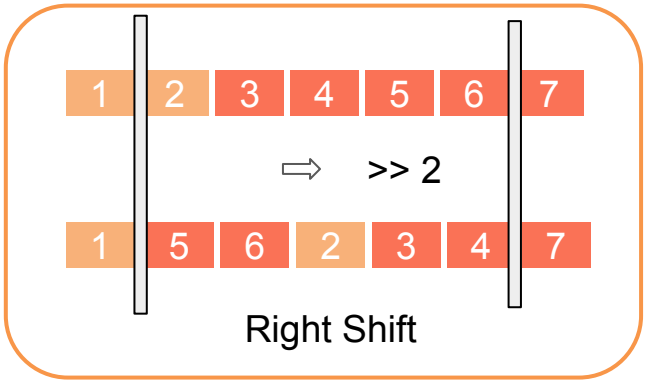
- Provide a good initial solution

Randomization

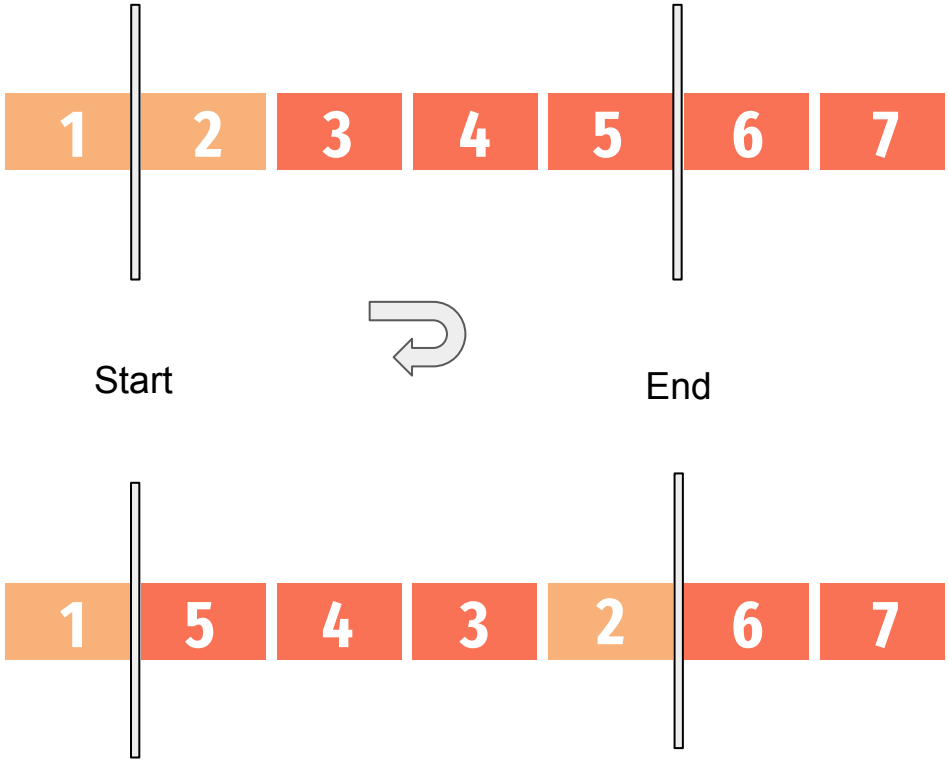


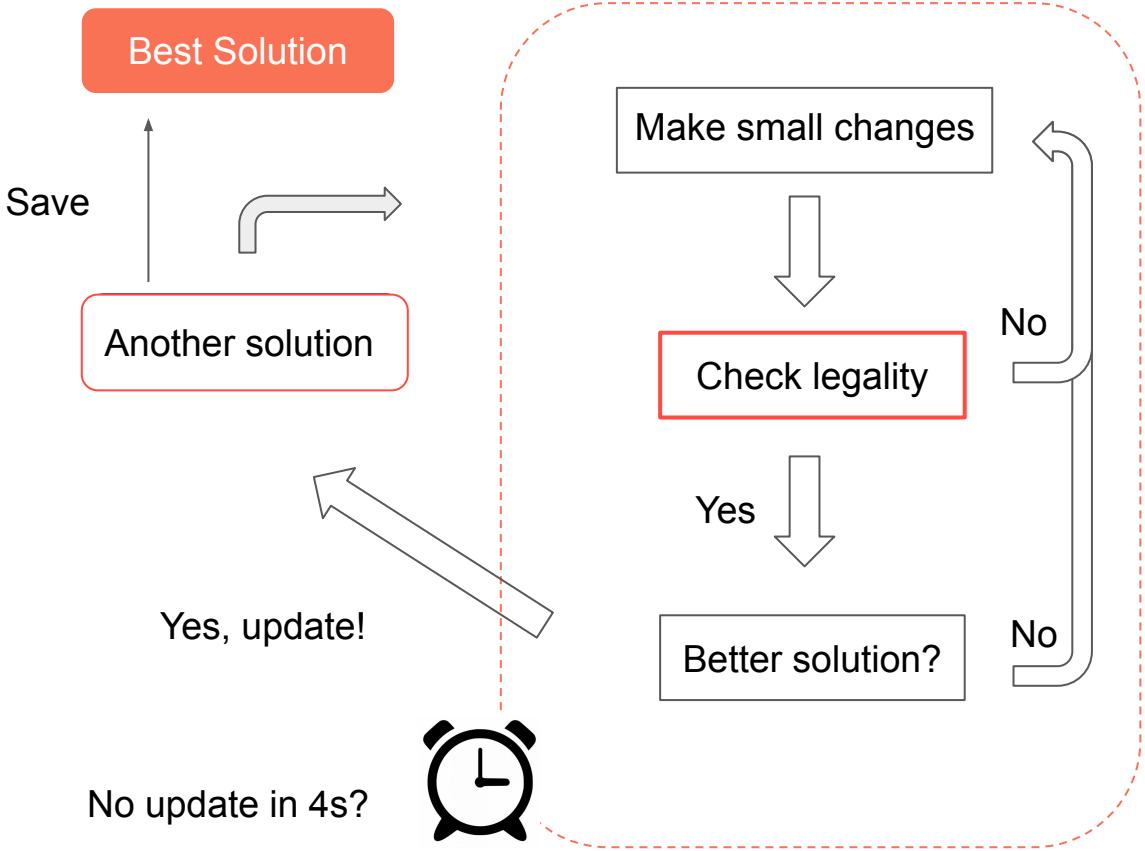




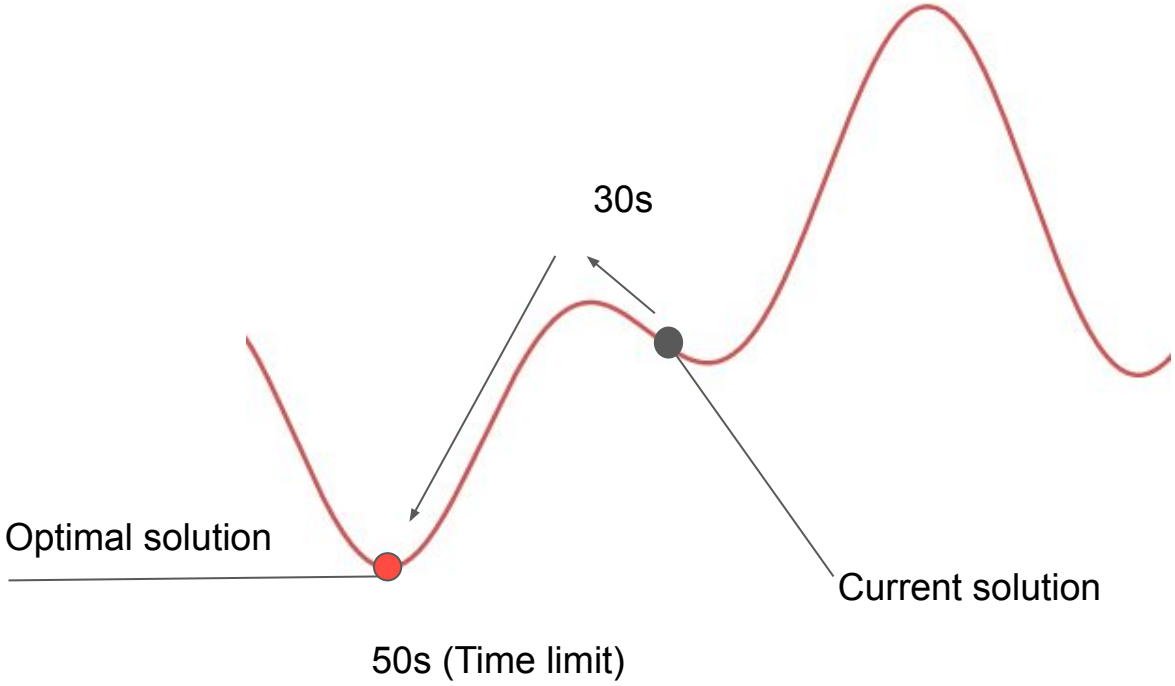


42 : Fabien Zhao



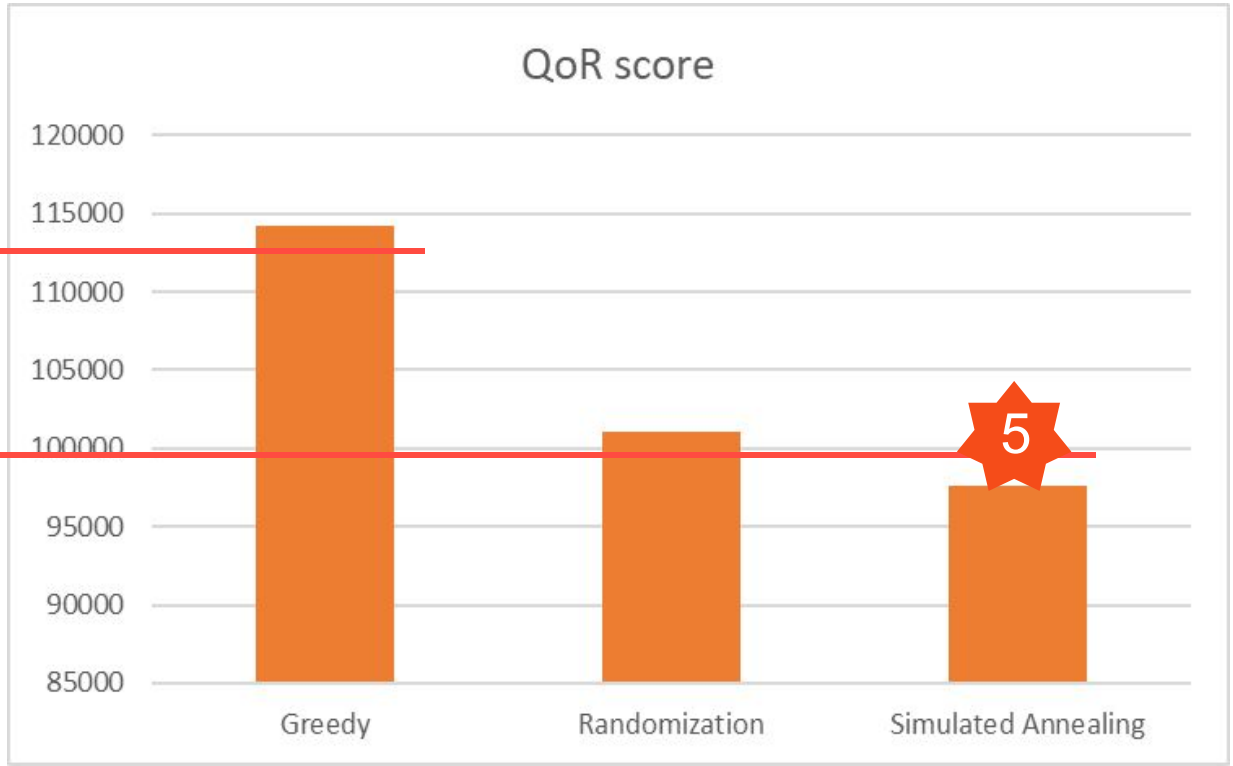

Best Solution
Save
Another solution
Make small changes
Check legality
No
Yes
Better solution?
No
Yes, update!
No update in 4s?

Simulated Annealing



Explore search space

Algorithm Result



TA moderate

TA good

QoR: Quality of Result

05

Pitch

Current GIS Map Is Not Designed For Seniors

1 Contain barrier for senior to use the technology

- Complicated procedures
- Irrelevant Distraction
- Lack of health and weather information
- Small text

2 Have no integration with healthcare resources

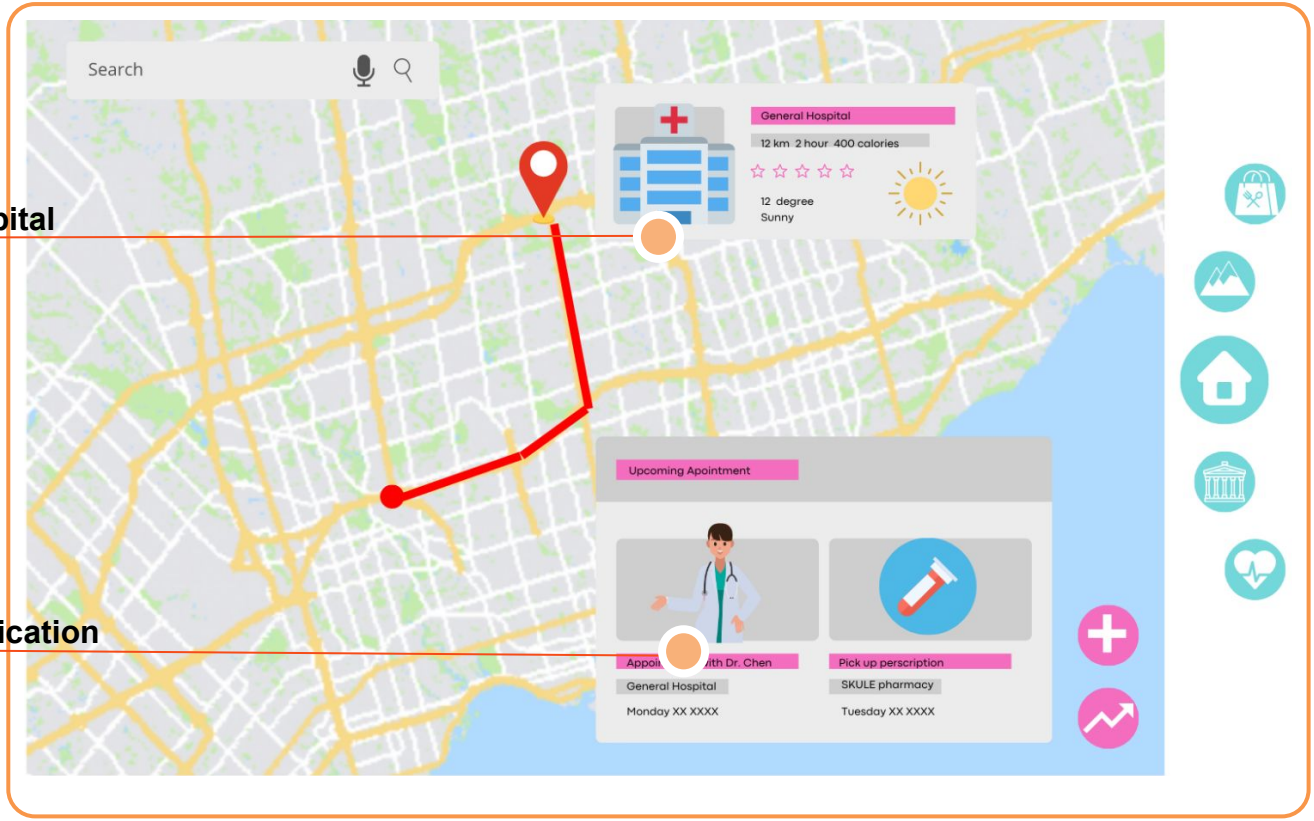
- Hospital Appointment notification
- Care location navigation
- Health Data Trend
- Mobile Access

Google Maps

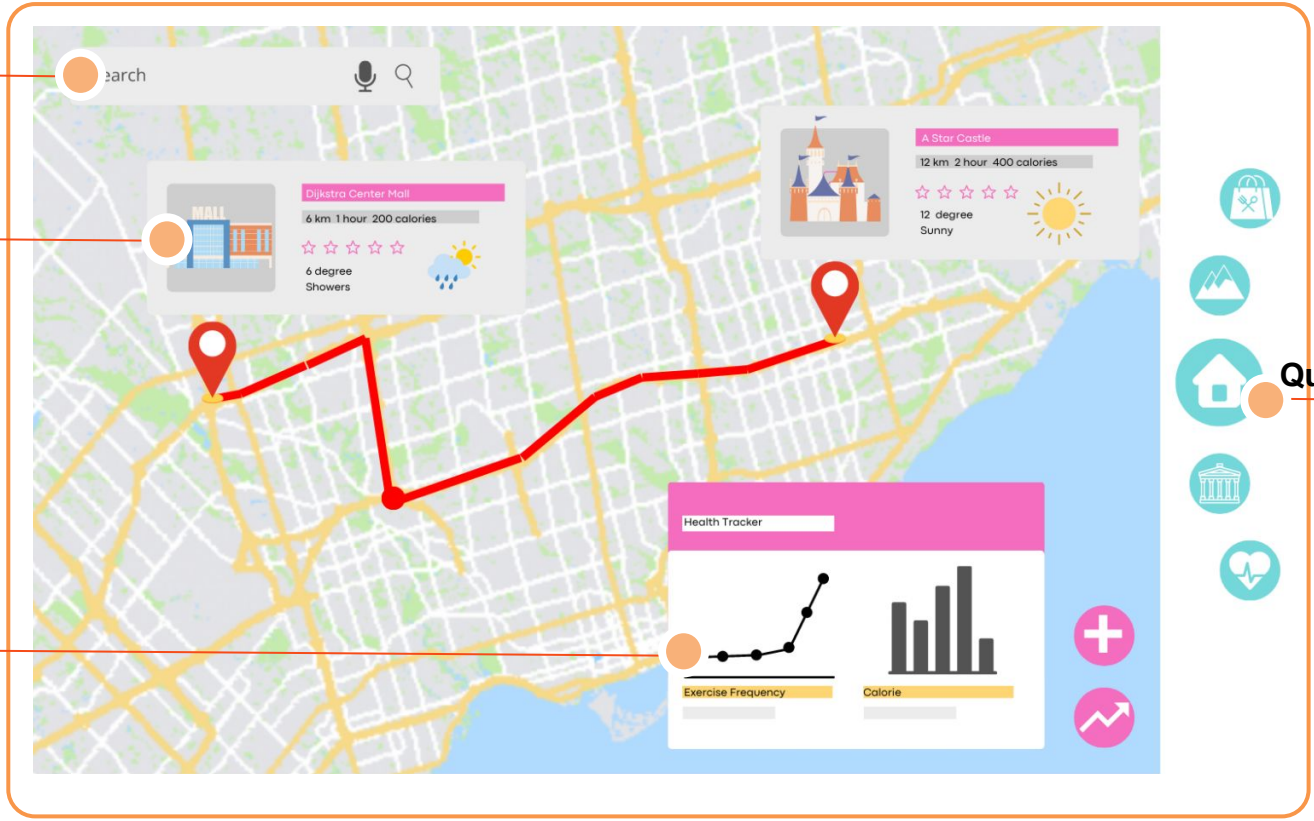
Health Care Integration Tailors to Senior Needs

Navigation to Hospital

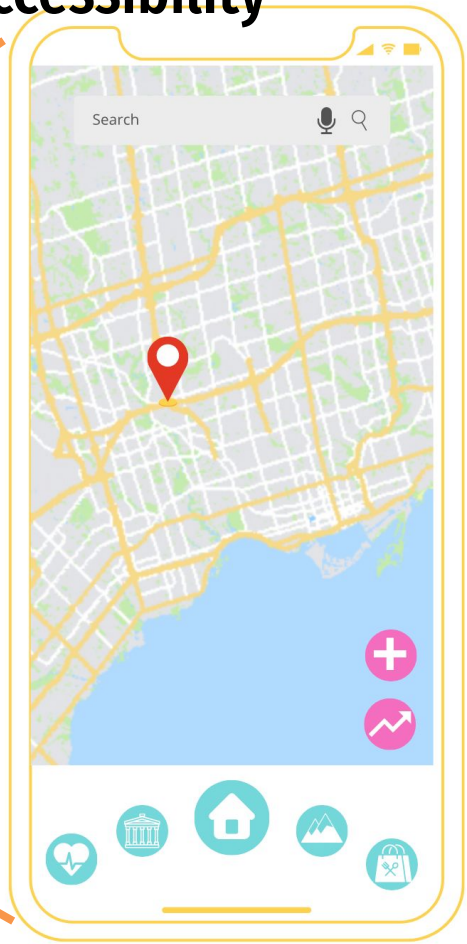
Appointment Notification



Health Care Integration Tailors to Senior Needs



Mobile Application Increase Accessibility



Development Timeline

Stage 1: six month

Finish Implementing Speech Recognition and Health Care Service Integration

Stage 2: four month

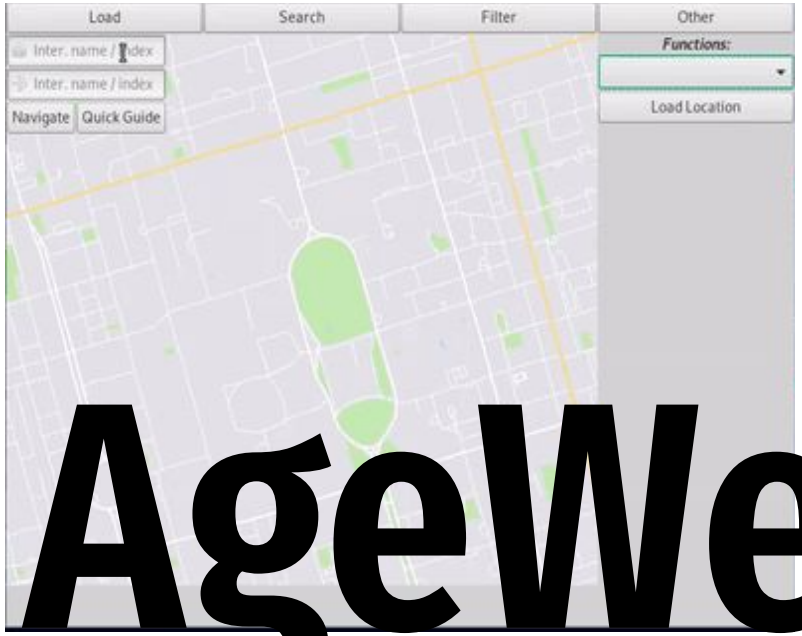
Internal functionality test and public usability test

Stage 3: four month

Expand to mobile application and launch on various platform such as app store and android

06

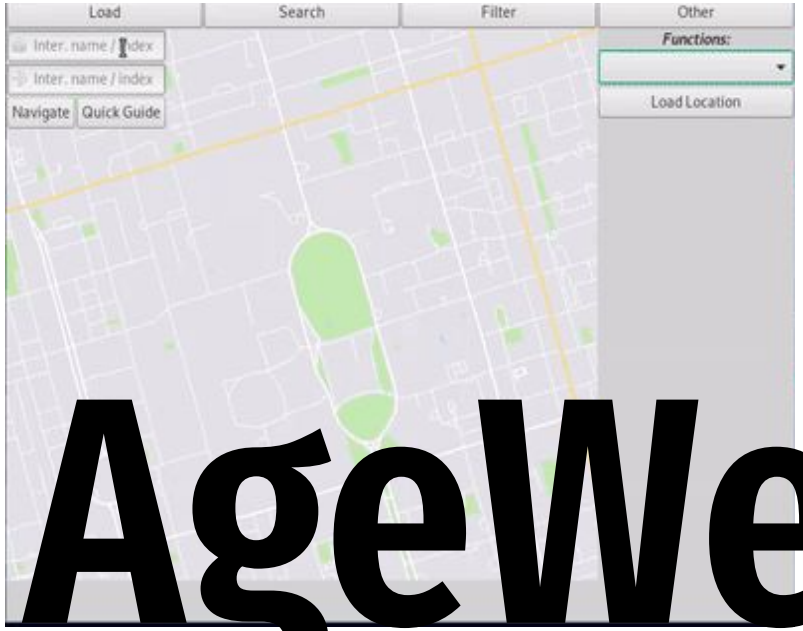
Conclusion



‘Minimum number of clicks’
‘Vision Friendly Text’
’Health & Weather Information’

AgeWell

Map your way to a healthy future



Q&A

AgeWell

Map your way to a healthy future

Reference

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Reference

[4]N. Zebardast, D. S. Friedman, and S. Vitale, “The prevalence and demographic associations of presenting near-vision impairment among adults living in the United States,” *American journal of ophthalmology*, vol. 174, Feb. 2017, doi: 10.1016/j.ajo.2016.11.004.

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[6] ece297 lecture20 astar and m3 opt betz 2023 slides with voice. Vaughn Betz, 2023.