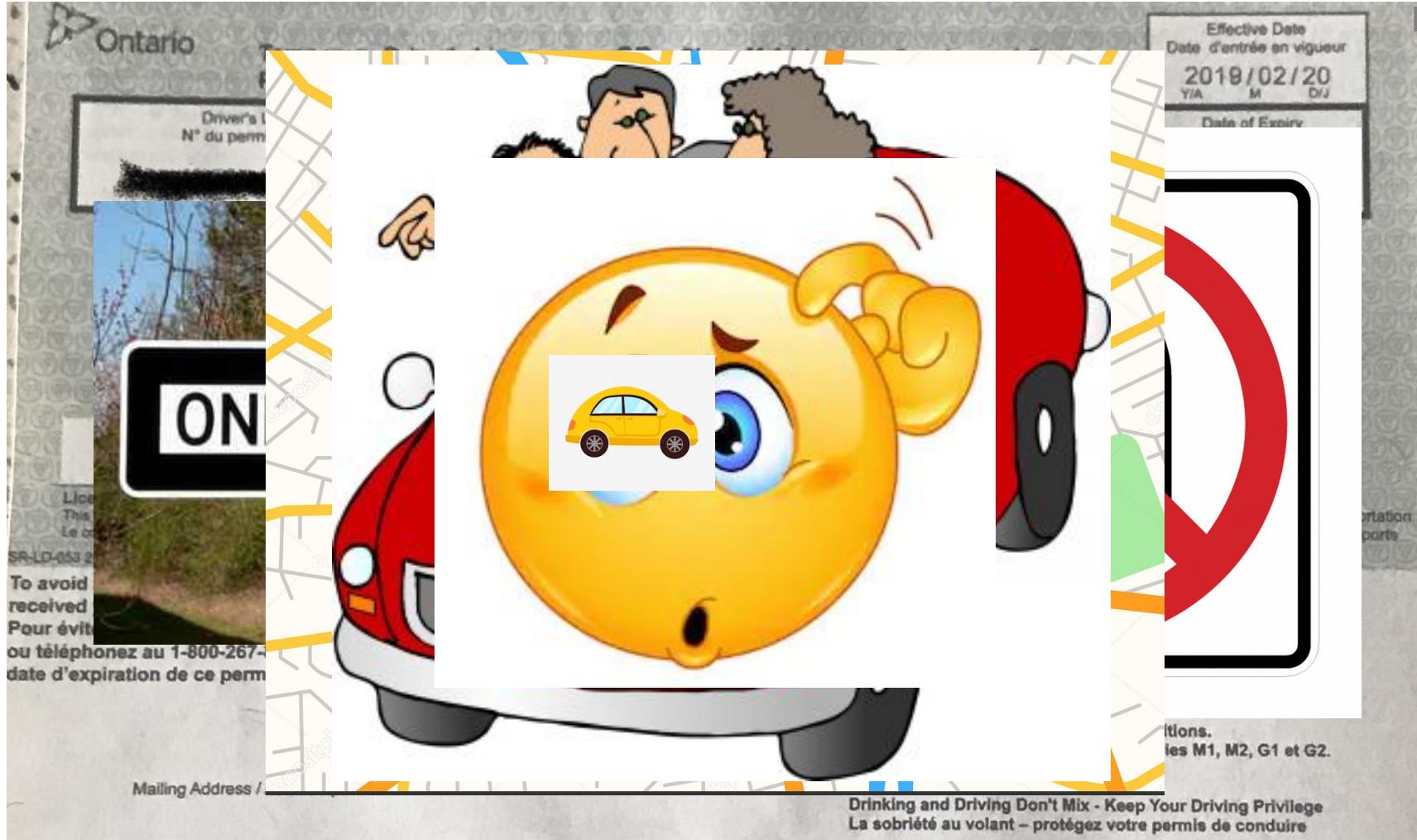




Driver Buddy

Peiyi Yu
Hongliang Wang (Baron)
Jintao Xu (Daniel)





Agenda

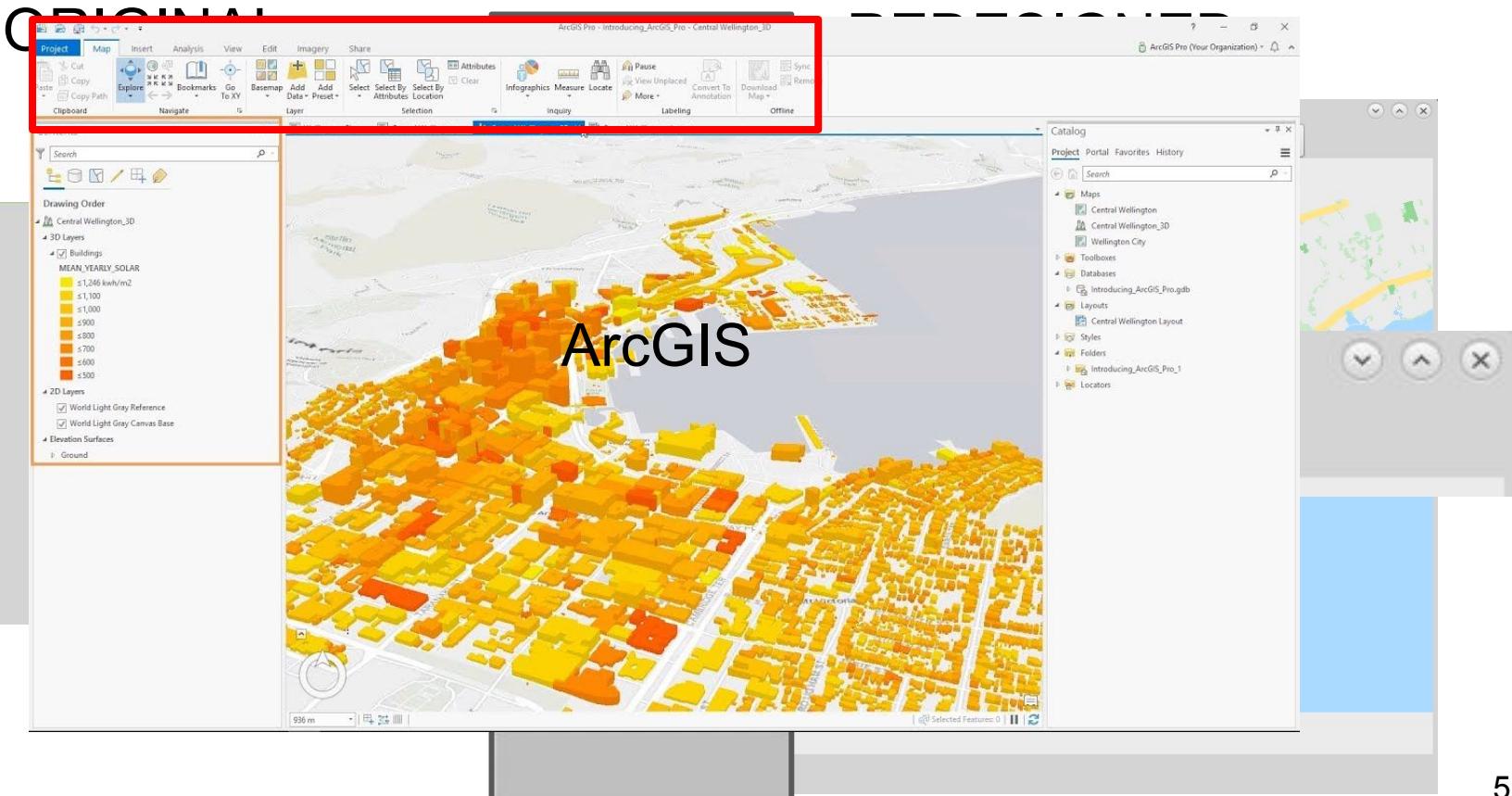
- 01 Manipulating the map
- 02 Useful Real-Time Info
- 03 Graphical Visualization
- 04 Algorithm
- 05 Future Pitches

PART 01

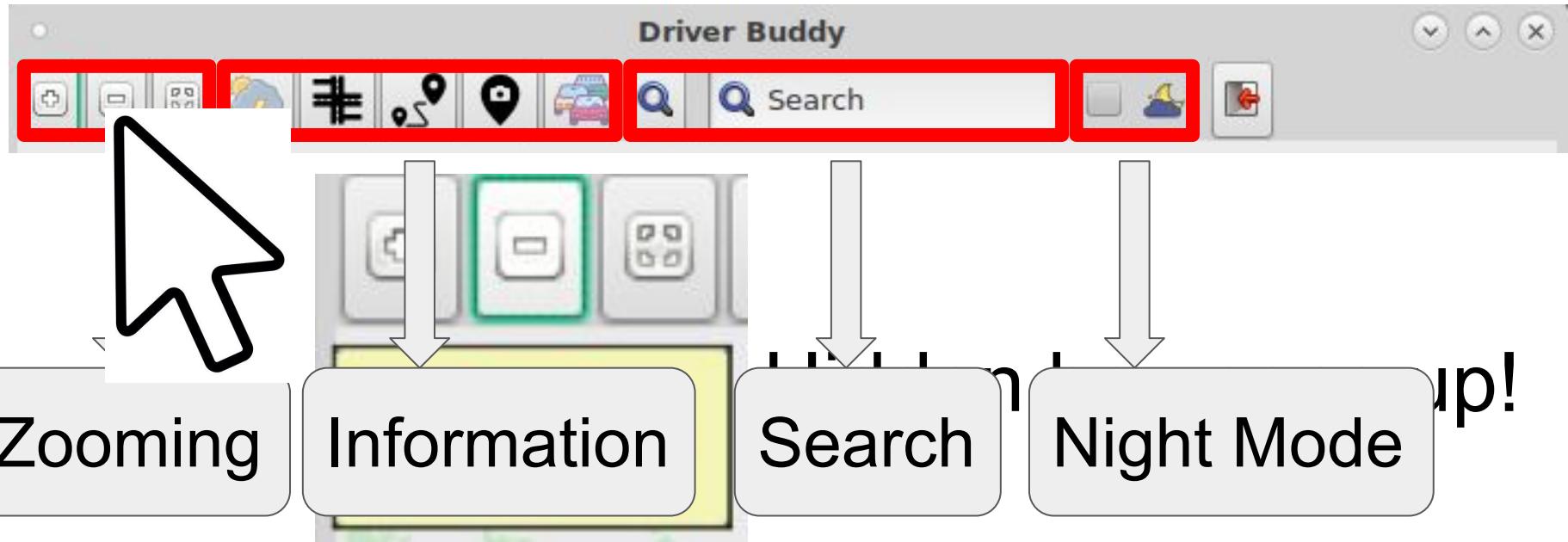
Manipulating the map

- Meua Bar
- Mouse Control
- Keyboard Shortcuts

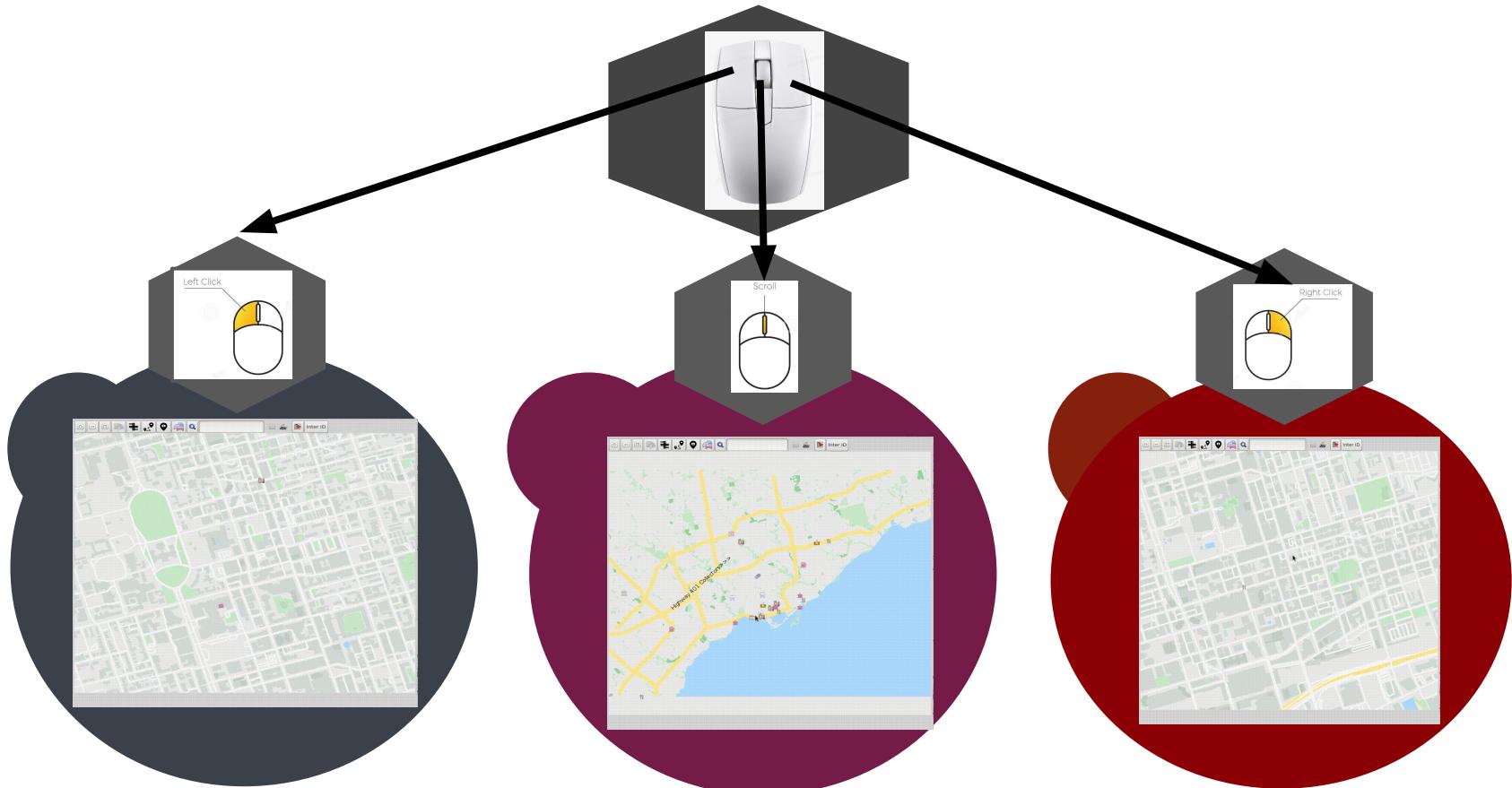
Save time from learning the software! [1]



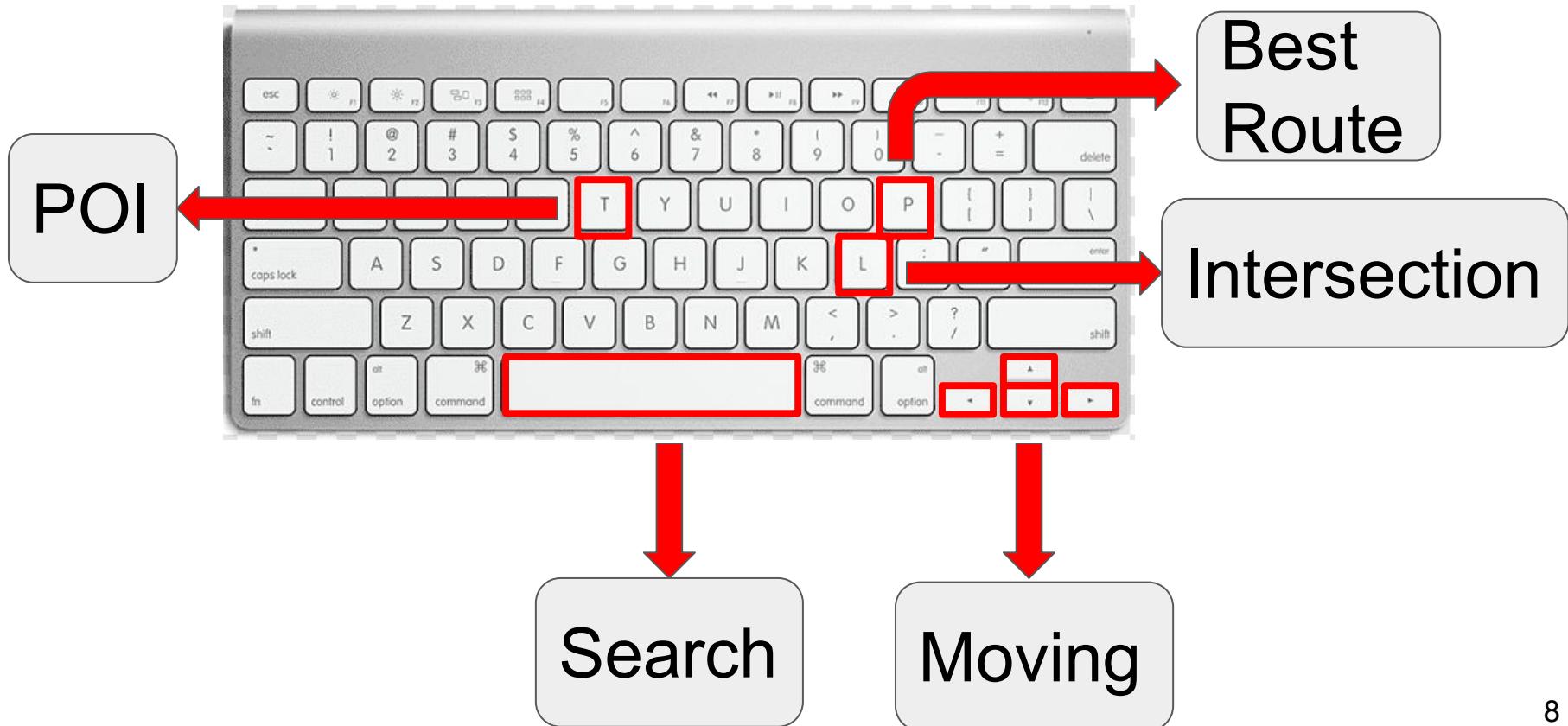
■ Menu Bar is simple to manipulate.



■ Mouse Control is easy for zooming.



■ Shortcuts save user's time.

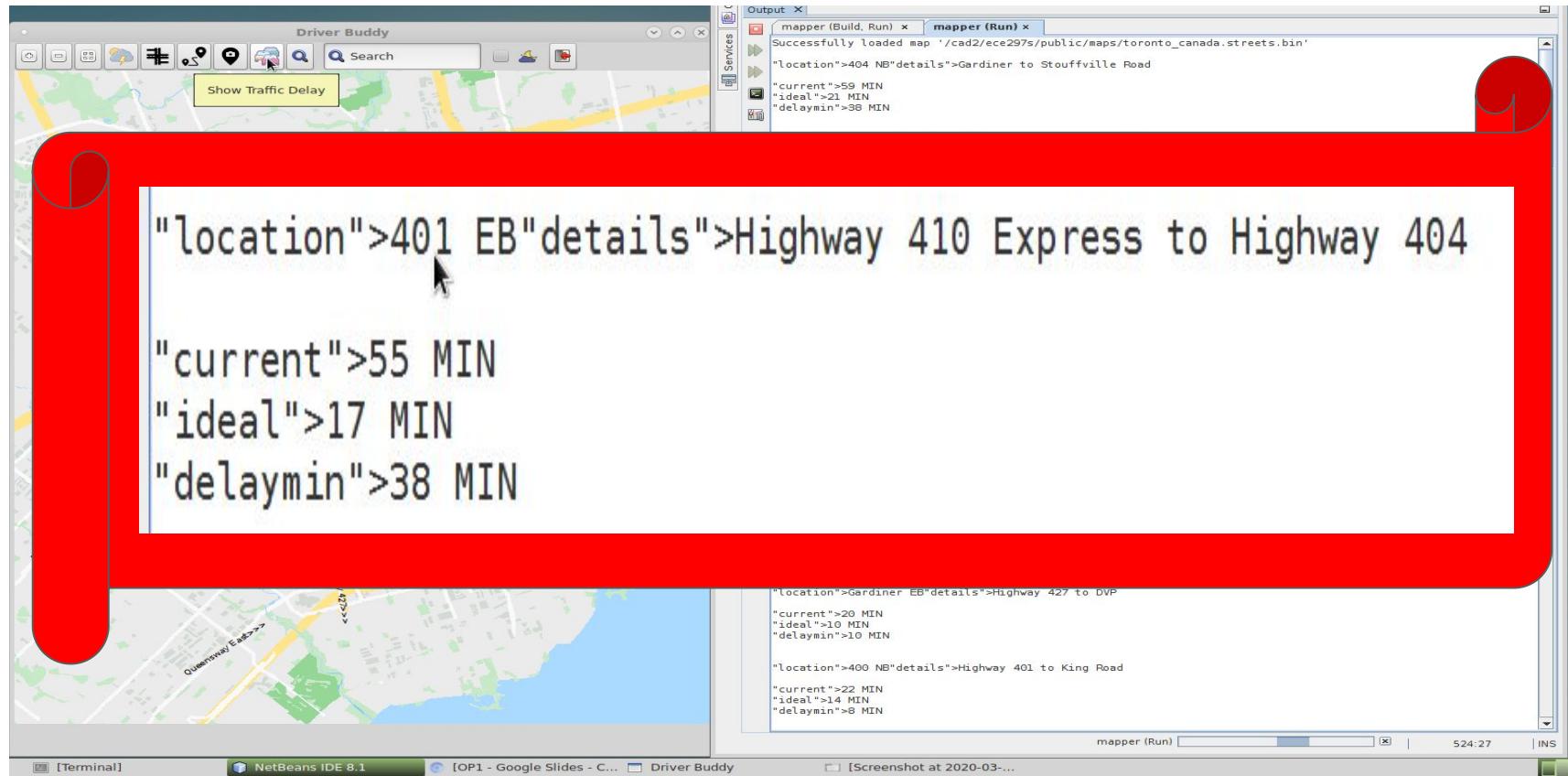


PART 02

Real-Time Info

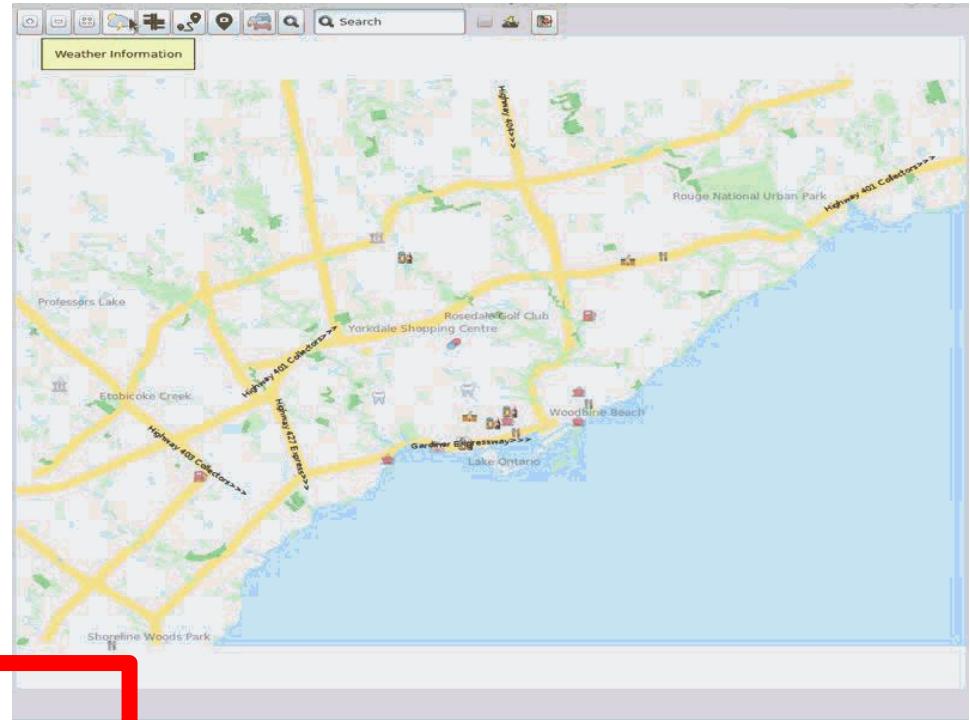
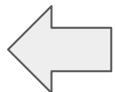
- traffic delay info.
- weather info.

Get real time traffic delay information



Display Weather information

- Real time data
- Reliable source [2]



PART 03

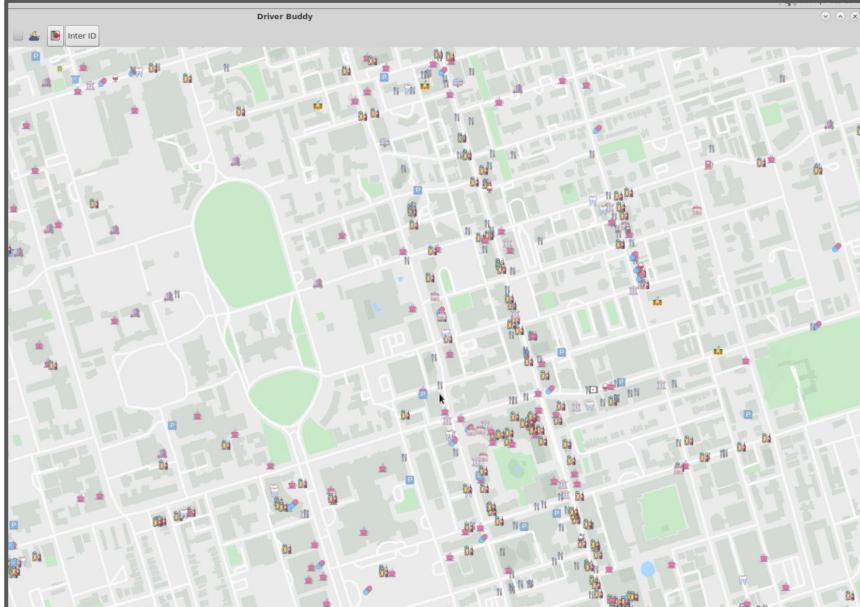
Graphical Visualization

n

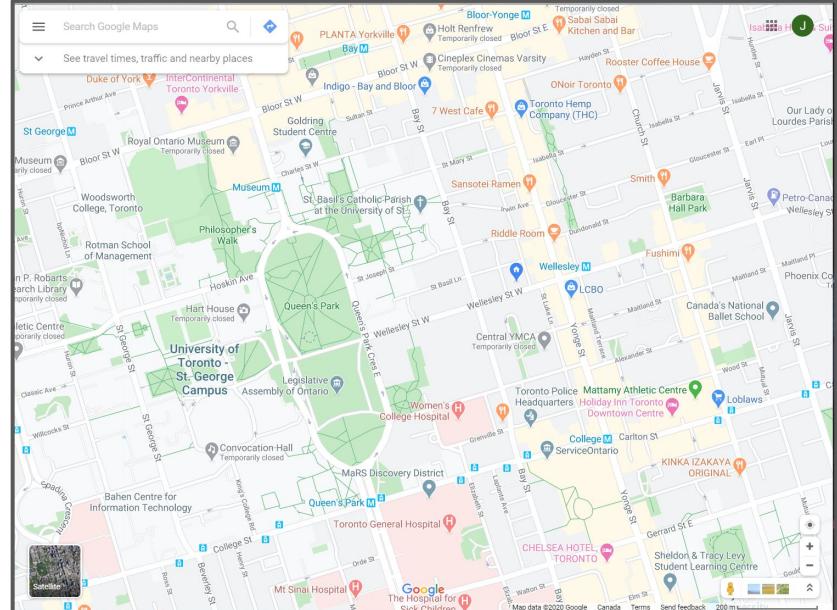
- Show objects with different colors
- Icons distributed on the map
- Day / Night mode
- the path from source to destination

■ Objects shown with different colors [3]

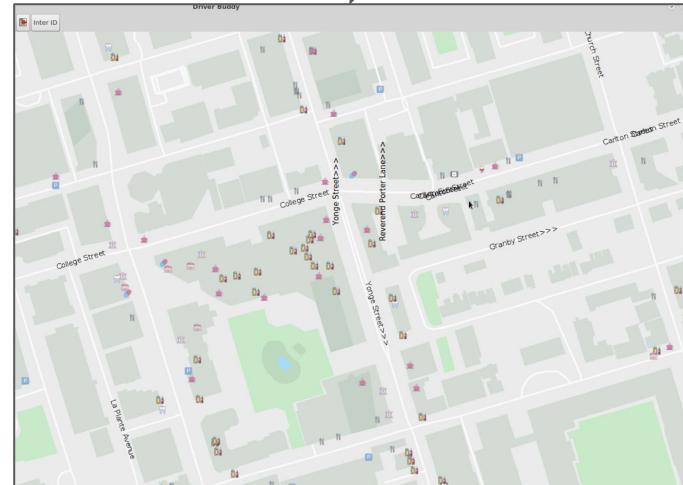
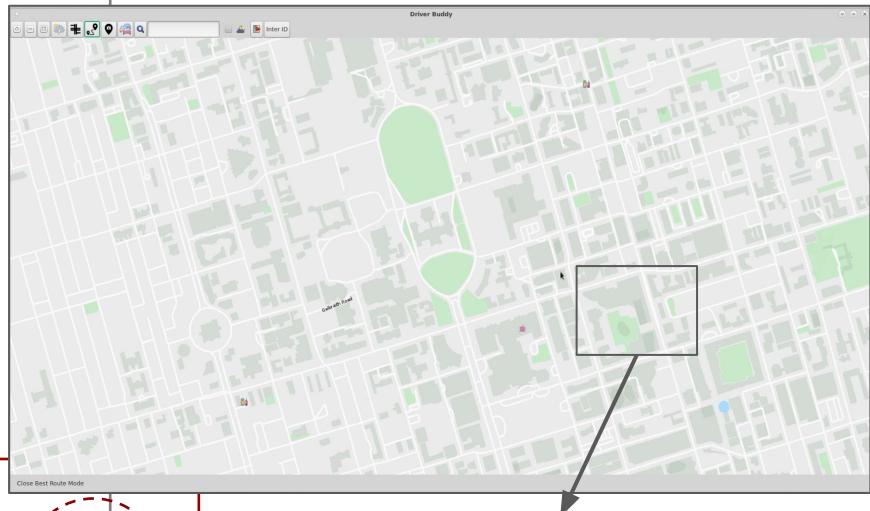
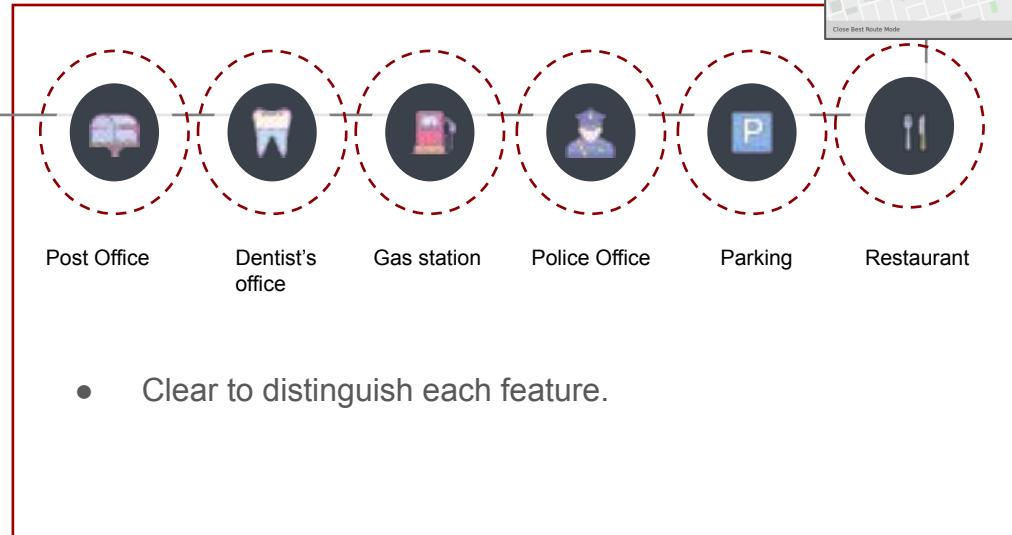
■ Driver Body



■ Google map

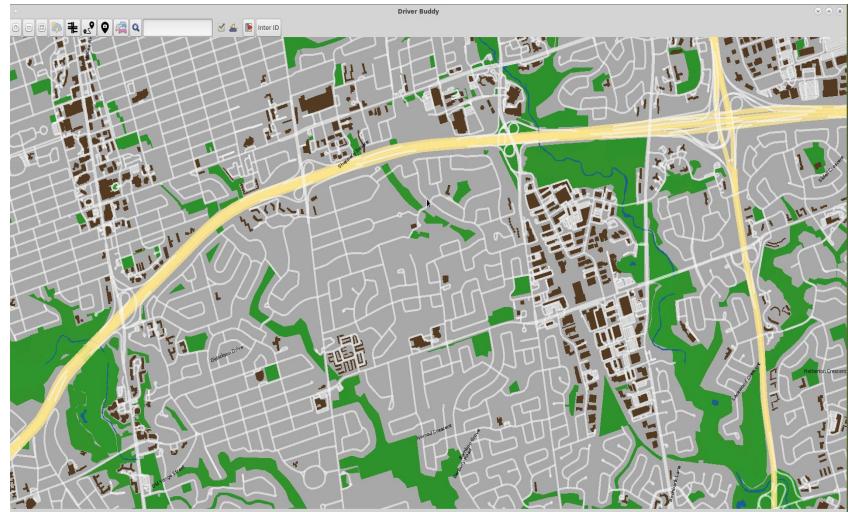
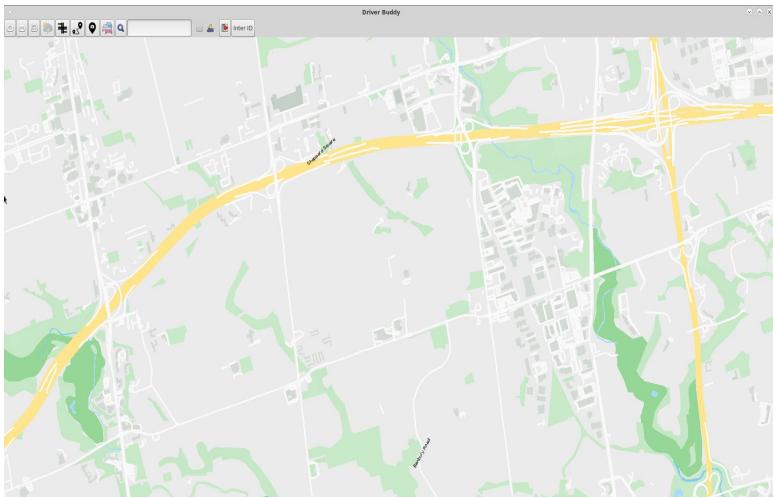


■ Icons indicates different points of interest



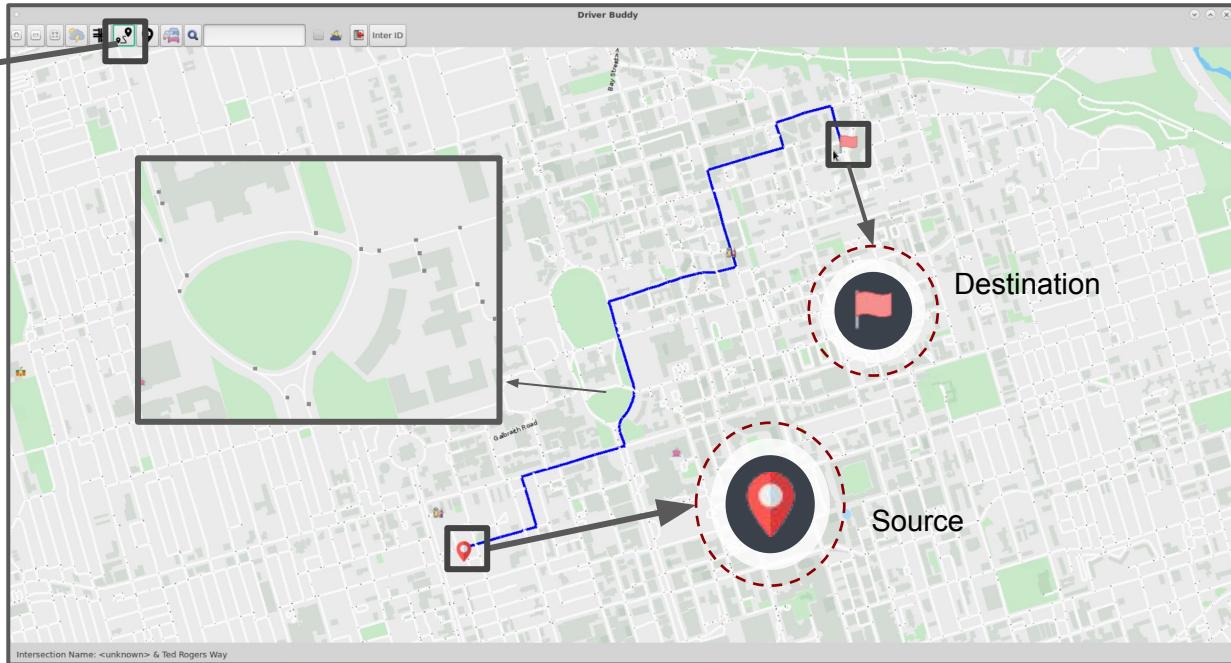
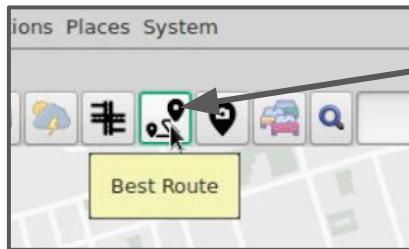
- Clear to distinguish each feature.

Night Mode Switch from Day mode



- Reduce brightness
- Safer

A path links the source to the destination



- All intersections are highlight.
- Blue path indicates the shortest path.
- All street names are printed on terminal.

```
Queen's Park Crescent East-->Queen's Park Crescent East-->College Street-->Queen's Park-->College Street-->College Street-->College Street-->College Street-->College Street-->Saint Joseph Street-->Saint Joseph Street-->Saint Joseph Street-->Saint Joseph Street-->Park Road-->Bloor Street East-->Bloor Street East-->Baldwin Street-->Saint Joseph Street-->Baldwin Street-->Yonge Street-->Yonge Street-->Yonge Street-->Yonge Street-->Yonge Street-->(end)
```

PART 04

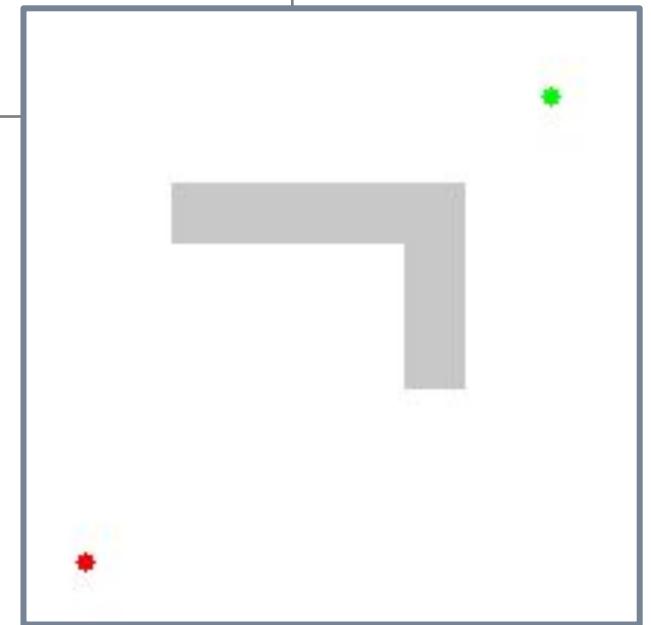
Algorithm

- Dijkstra's algorithm
- Simulated Annealing algorithm

Find the Shortest Path

Dijkstra's algorithm

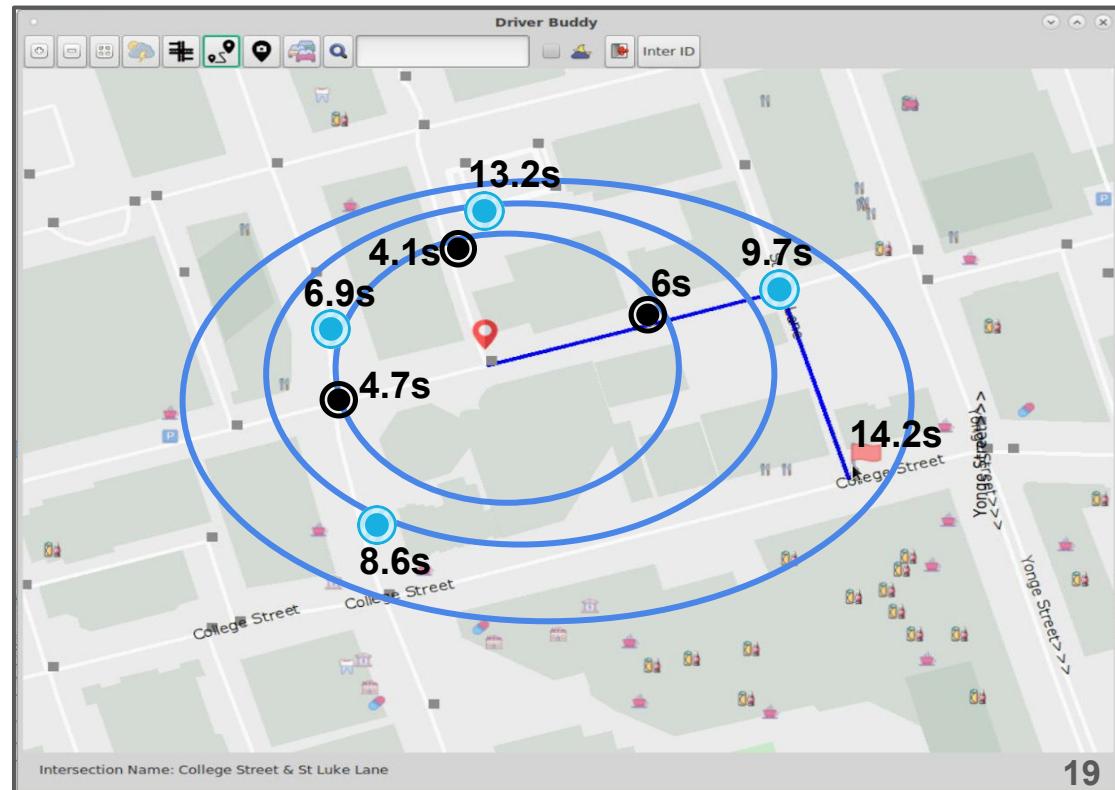
- Find every closest intersections with each expand loop.
- Stop to expand loop until find the end intersection.
- Each time will save the shortest time to pass through the intersection



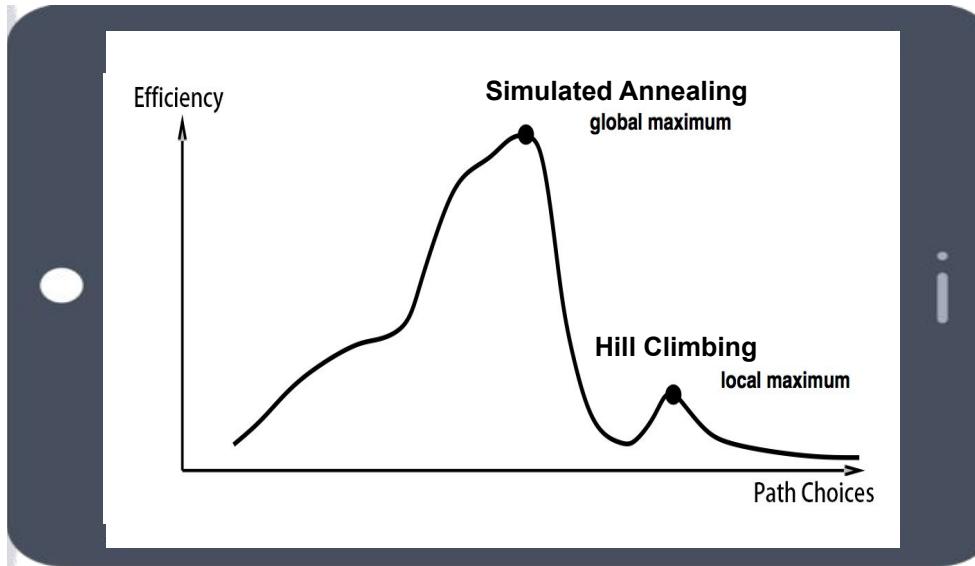
■ Update shortest time from source to current intersection

Benefit to Driver

- Most efficiency path
- Show path names
- Response within 1s



■ Find global max. efficiency among local max.

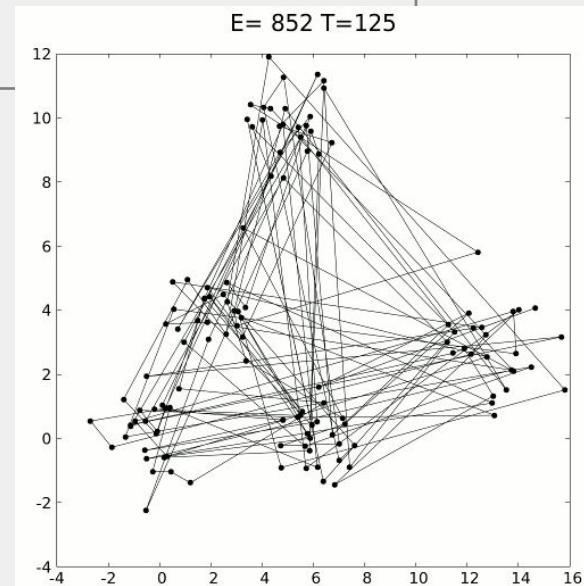


- Simulated Annealing algorithm
 - Enable to find most efficiency path
 - Less operate time if small number of delivers points

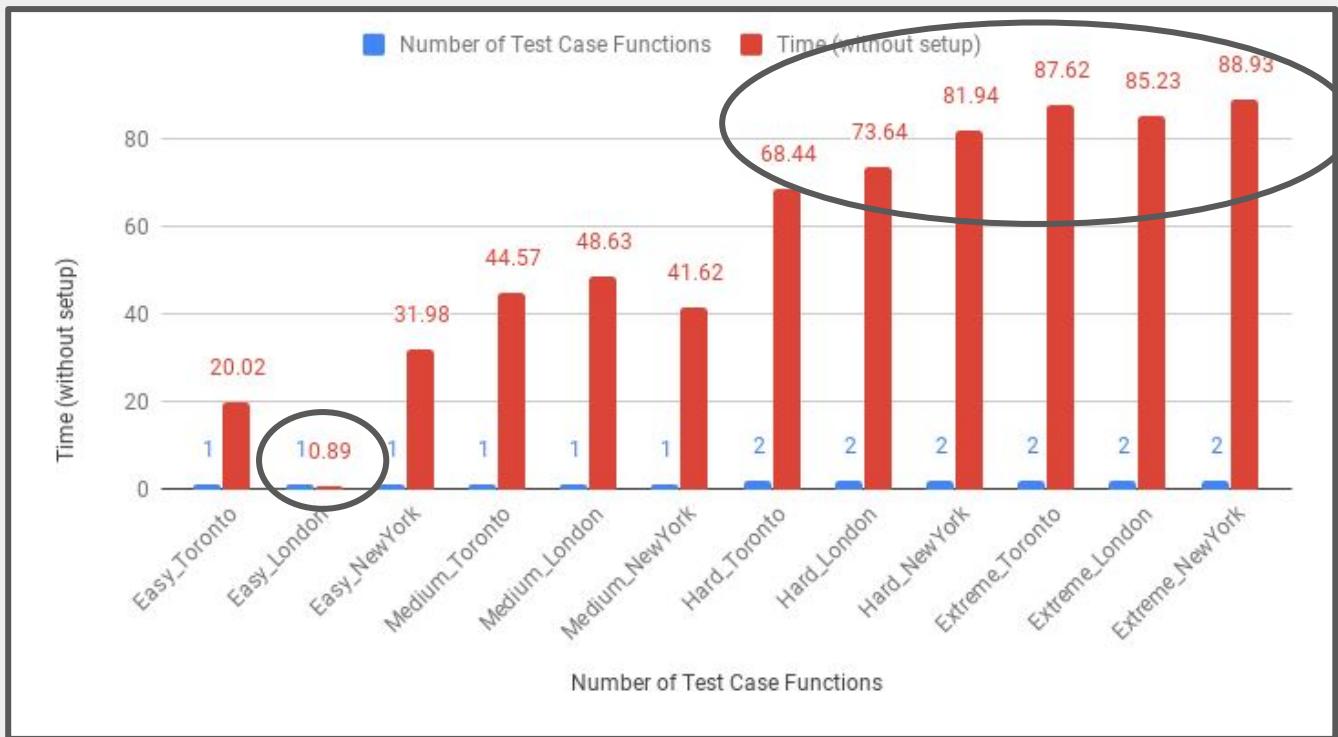
Find different paths by swap multiple pairs of points

Simulated Annealing algorithm

- Find out one paths
- Swap two point randomly
 - Check Pick off and drop off order
 - Check with capacity
- Control the time restriction within 50s (Include set up)



Milestone 4 Test Cases Performance



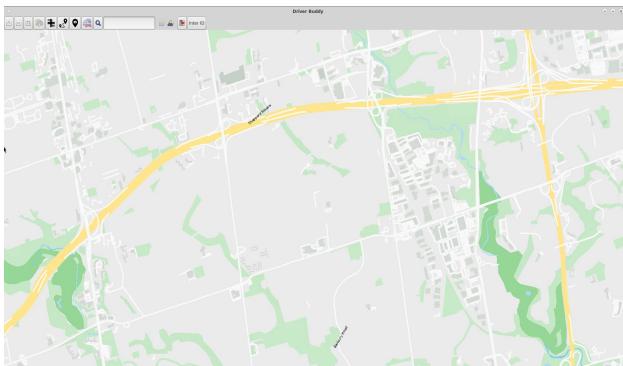
- Successfully decrease time processing with different type of path scale.
- Within 45s for each test case, and average around 18s for first three test cases.

PART 05

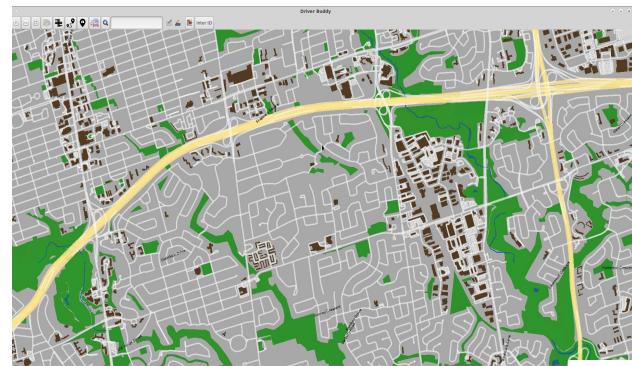
Future Pitches

- Map voice
- Traffic alert & condition
- Real time Speed

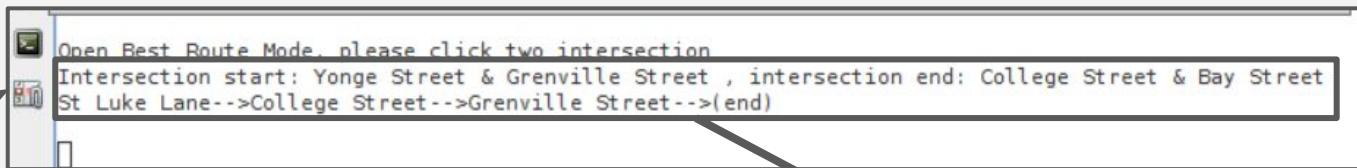
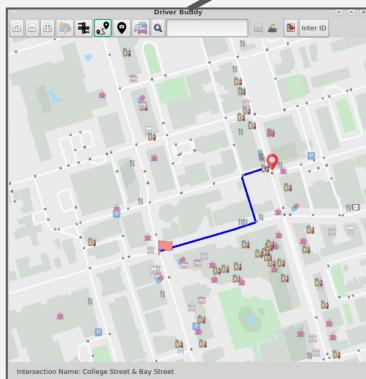
Map Voice Control recognizes the voice



“Switch to night mode”

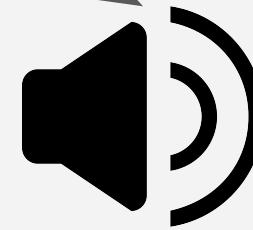


Map speaks.



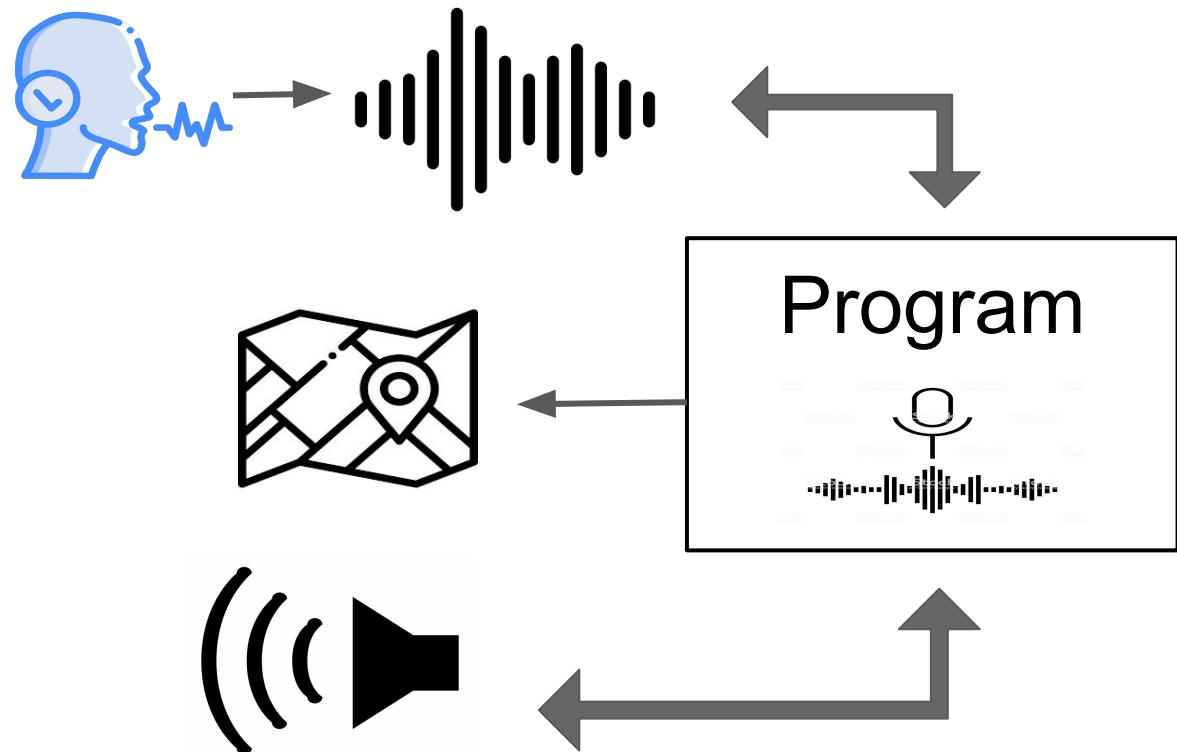
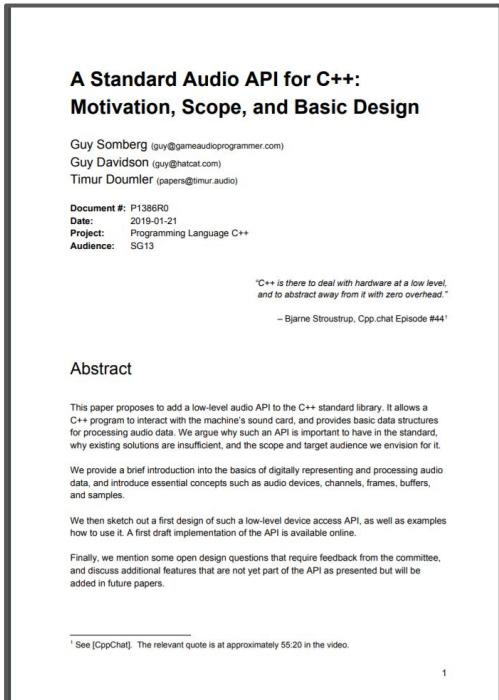
Benefit for driver

- Reminds the direction to drivers
- Avoid potential risks of looking map

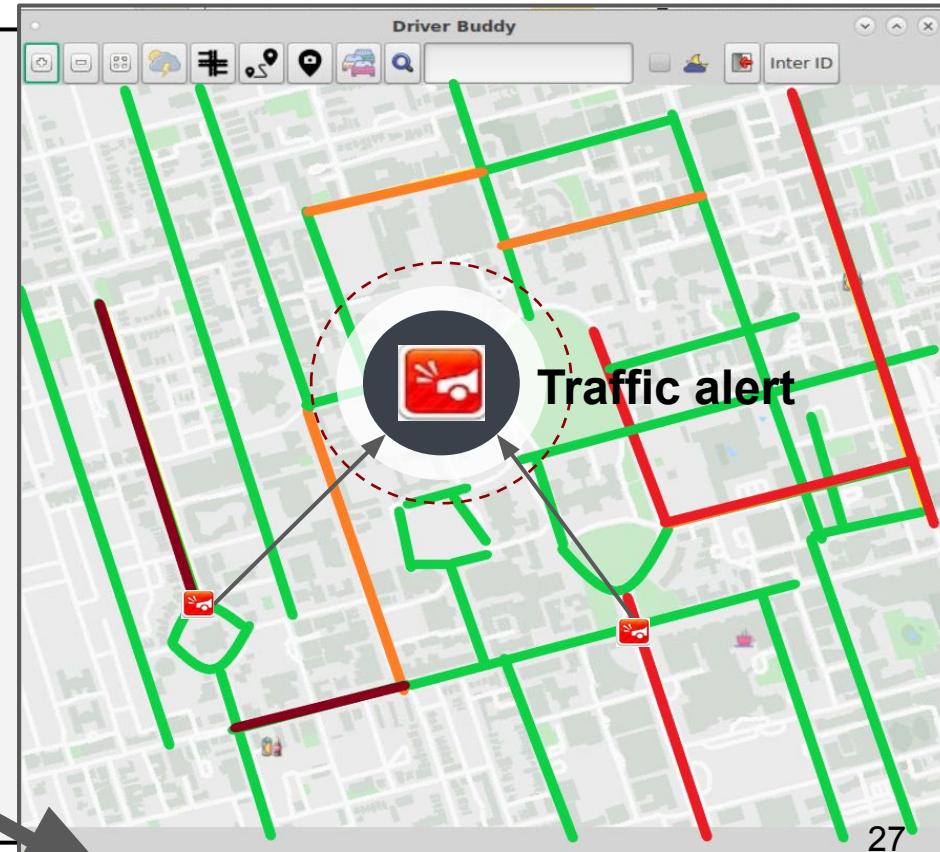
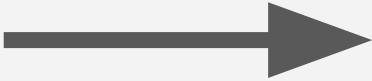
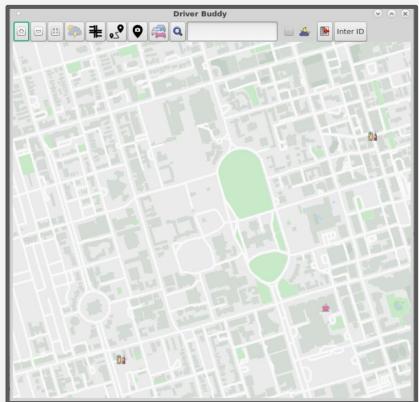


Implementation of recognizing the voice and making sounds.

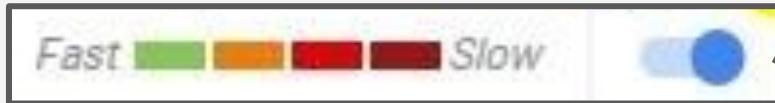
Daniel



Map shows Traffic Alert & Road Condition by Different Colors



- Showing traffic accident
- Highlight car density on road
- Improve all algorithm with traffic constrain



Implementation of Traffic alert & condition

Traffic API

[GET YOUR KEY](#)

[HOME](#) [DOCUMENTATION](#) [API EXPLORER](#)

Service version: 4
Last edit: 2019.05.16

On this page

- [Purpose >](#) [Common use cases you can implement >](#)
- [Getting Started >](#) [Features >](#)

Purpose

What is the Traffic API?

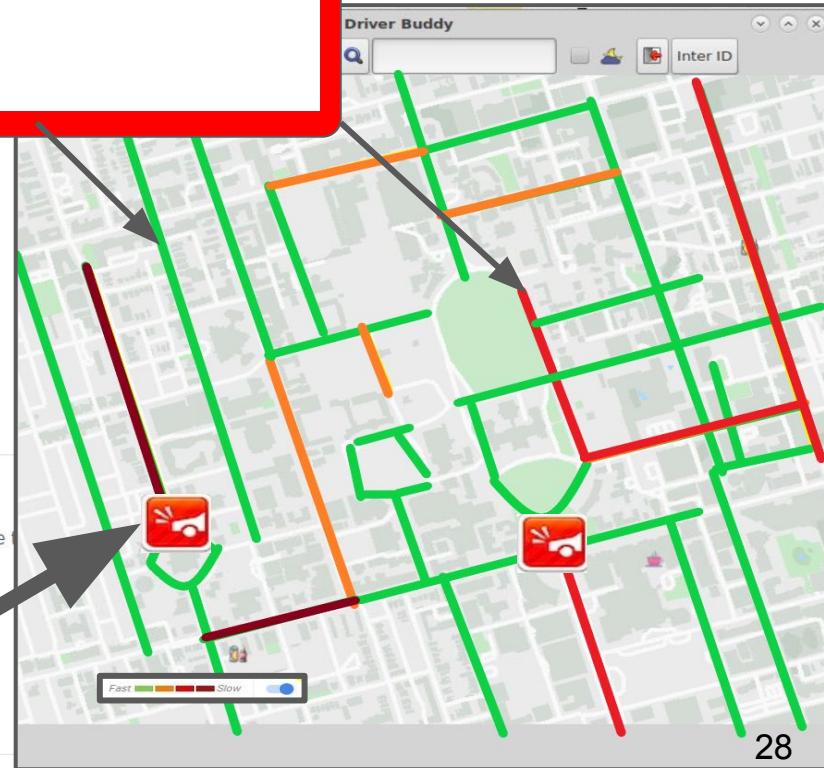
The Traffic API is a suite of web services designed for developers to create web and mobile applications around real-time traffic data. It can be used via RESTful APIs.

The offering is split into:

- **Traffic Incidents:** This provides an accurate view about *traffic jams* and *incidents* around a road network.
- **Traffic Flow:** This provides *real time observed speeds* and *travel times* for all key roads in a network.

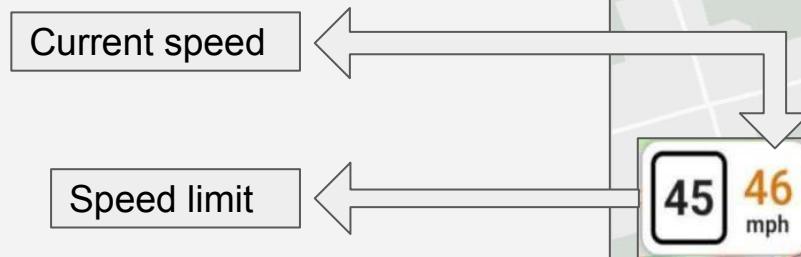
The Traffic API web services are based on the real-time traffic data TomTom Traffic™.

```
"location">401 EB"details">Highway 410 Express to Highway 404  
"current">55 MIN  
"ideal">17 MIN  
"delaymin">38 MIN
```



Map shows the current speed limit on the interface

- Using GPS to get the real time location
- Measure the real time speed
- Warning if over than road speed limit

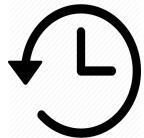


Summarizing our map design



Menu Bar

- Easy Notice
- Hint page
- Fast process

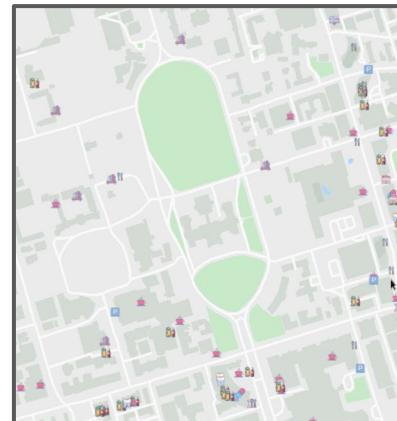


Real time info.

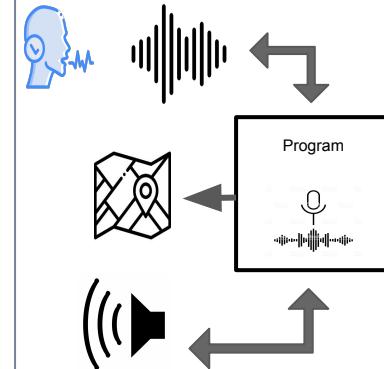
- Reliable
- Easy Notice



Graphical Visualization



voice navigation





**Thank you for
listening!**

Reference

[1]<https://reader.elsevier.com/reader/sd/pii/S0747563204000627?token=076804C63BEF9EF77311E59A56852C0E725A4352289271406F14CF81A80572BBAF7691A6F4CC87EB800D2F3519FA59D>

[2] <https://darksky.net/forecast/40.7127,-74.0059/us12/en>

[3]https://books.google.ca/books?hl=zh-CN&lr=&id=iul1gVd3NT8C&oi=fnd&pg=PA6&dq=color+commons+sense&ots=XeXULAGNj_&sig=zp_Wf8MOGNOS7HUGFuhn8XqOld4&redir_esc=y#v=onepage&q&f=false

[4] 21 slide picture. the picture source is from https://en.wikipedia.org/wiki/Simulated_annealing

[5] 22 slide. the data comes from the real test case on running our program.

[6] 26 slide. It includes the operation of C++ audio. <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2019/p1386r0.pdf>

[7] 28 slide. color represent for car density, we search the current GIS which is ArcGIS system, and the important of red color

https://help.anylogic.com/index.jsp?topic=%2Fcom.anylogic.help%2Fhtml%2F_RoadTraffic%2Freference%2FTrafficJams.html

https://cms.rmau.org/uploadedFiles/Credit_Risk/Library/RMA_Journal/Construction_Issues/Red%20Warning%20Flags%20of%20Contractor%20Failure.pdf

[8] 29 slide. GPS module <http://walterdalmut.com/2013/11/23/raspberry-pi-c-gps-nmea-library-global-positioning-system/>