

Presentation of the team



Miguel Vasquez

Code and technical report



Juan Alberto Rodriguez

Code and
technical report



Andrea SernaLiterature review

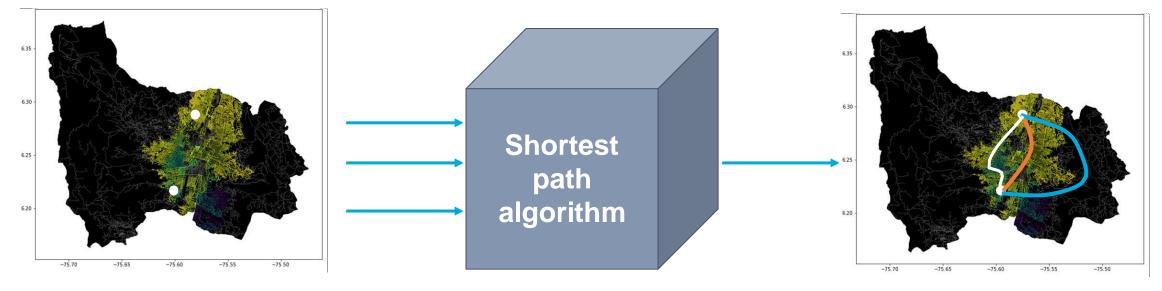


Mauricio Toro y
Jaime Andres
Riascos
Data preparation



https://github.com/bosh99/SH-proyect.git

Problem Statement

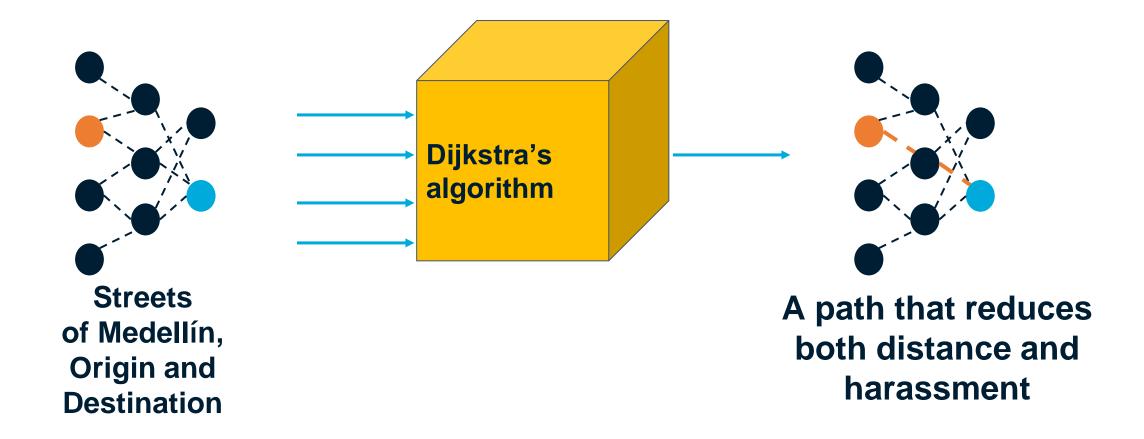


Streets of Medellín, Origin and Destination

Three paths that reduce both the risk of harassment and distance

Solution Algorithm

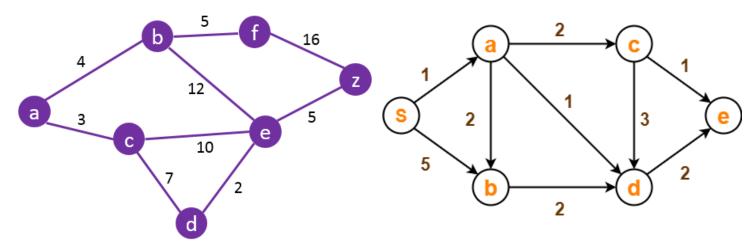






Explanation of the algorithm







Dijkstra's algorithm

This algorithm finds the shortest path between a given node and all the other ones in the graph using weights that minimizes the total distance



Complexity of the algorithm



| | Time complexity | Complexity of memory |
|------------|-----------------|--------------------------------|
| Dijkstra's | O (E*logV) | O(E!*V*E*E*2 ^E) |
| N/A | | |

Time and memory complexity of the algorithm name. V is the vertex's E is the edges.





First path minimizing d = SH*L



| Origin | Destination | Distance (meters) | Risk of harassment (between 0 and 1) |
|------------------|---------------------|-------------------|--------------------------------------|
| EAFIT University | National University | 5082.36 | 0.0019 |

Distance and risk of harassment for the path that minimizes d = SH*L. Execution time of 0.786 seconds.

The data in the table explains the distance between the universities and we can see that the risk between them its very low which concludes that the algorithm significantly reduces the risk.



Second path minimizing d = SH+L



| Origin | Destination | Distance (meters) | Risk of harassment (between 0 and 1) |
|------------------|---------------------|-------------------|--------------------------------------|
| EAFIT University | National University | 7894.27 | 0.0017 |

Distance and risk of harassment for the path that minimizes d = SH+L. Execution time of 0.714 seconds.

Now we can see that the distance is greater, and the risk continues being low, also the time compilation determines that the algorithm its fast and efficient because of the results it shows



Third path minimizing $d = SH^2 * L^2$



| Origin | Destination | Distance (meters) | Risk of harassment (between 0 and 1) |
|------------------|---------------------|-------------------|--------------------------------------|
| EAFIT University | National University | 642144.12 | 0.000012 |

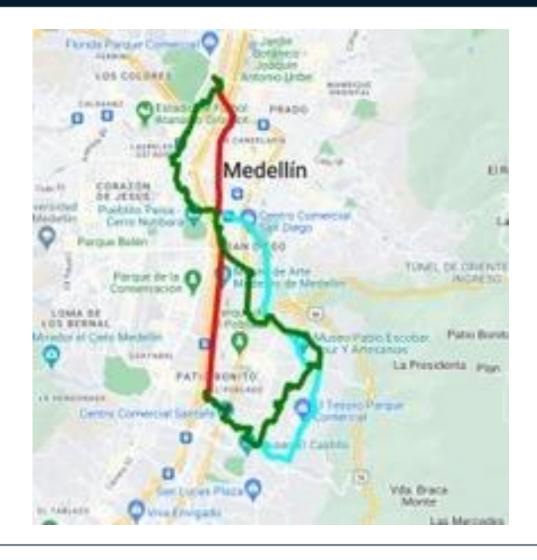
Distance and risk of harassment for the path that minimizes $d = SH^2 * L^2$. Execution time of 0.999 seconds.

The distance continues being greater and the risk continues being lower, so there's a relation between distance and risk in which when the distance increases the risk is lower.



Visual comparison of the three paths







Future work directions



Data structures and algorithms II

Applying another uses of data structures

Data bases

Creating a data base for the project

Telematics

Using more advanced concepts

Statistics

• • Drawe • conclusions for improving



Future work directions



Project management

Planning and organization

Project 1

More code for more efficiency

Software Engineering

> Successful app

Project 2

Givinganotherapproach



