Project for the creation of fast and safe routes avoiding sexual harassment and violence

UNIVERSIDAD EAFIT

Presentation of the team

Mariana Gutierrez
Research, coding.

Esteban Giraldo
Research, coding.

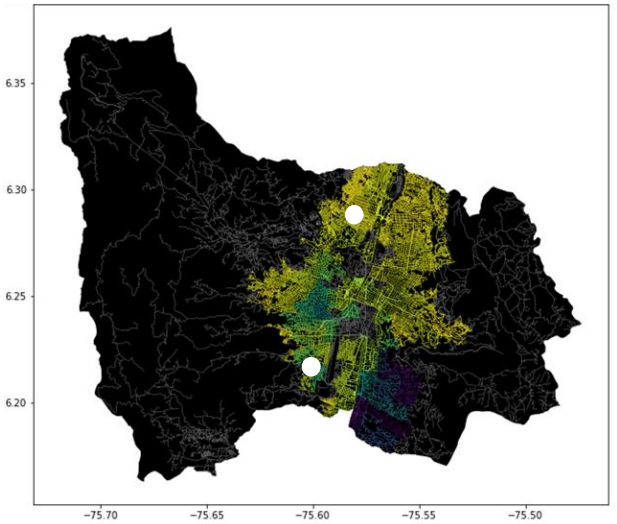
Andrea Serna
Literature review

Mauricio Toro
Data preparation

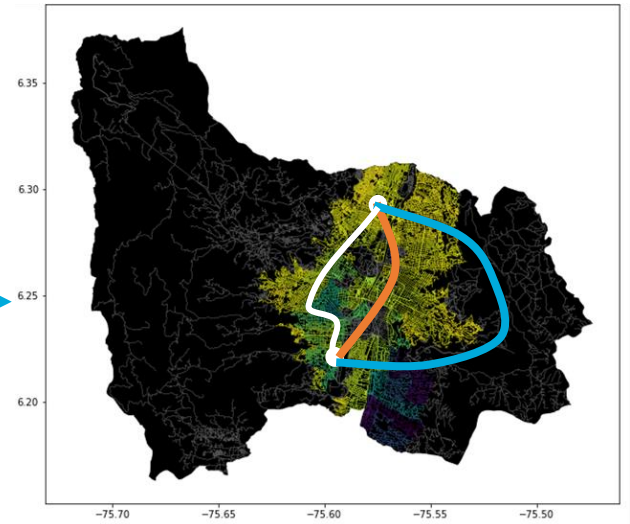
https://github.com/gutim1011/ST0245-001

UNIVERSIDAD EAFIT

Problem Statement



Shortest path algorithm

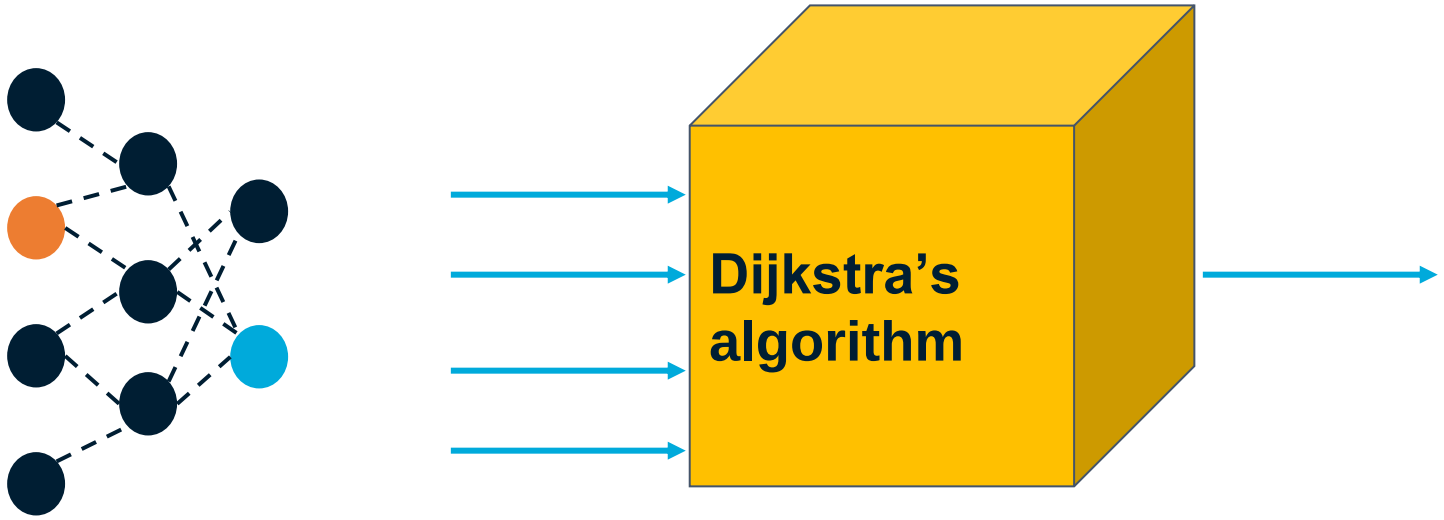


Streets of Medellín, Origin and Destination

Three paths that reduce both the risk of harassment and distance

UNIVERSIDAD EAFIT

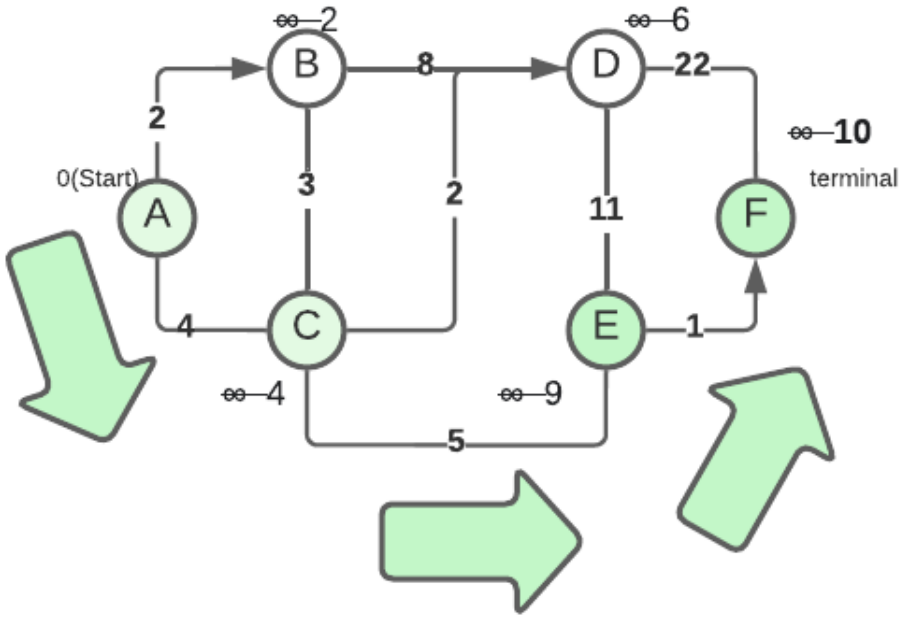
Solution Algorithm



Streets of Medellín, Origin and Destination

A path that reduces both distance and harassment

Explanation of the algorithm



Dijkstra’s algorithm

for the weight of each edge we decided to make an average between both values

Complexity of the algorithm

	Time complexity	Complexity of memory
Algorithm name	O((|E|+|V|) log |V|)	O(V2)

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

First path minimizing d = sexual harassment

Origin	Destination	Distance (meters)	Risk of harassment (between 0 and 1)
EAFIT University	National University	18.439 m	0.38

Distance and risk of harassment for the path that minimizes d = risk. Execution time of 0.1406 seconds, this path will be the longest but the safest option from the three.

Second path minimizing d = ???

Origin	Destination	Distance (meters)	Risk of harassment (between 0 and 1)
EAFIT University	National University	9.407 m	0.70

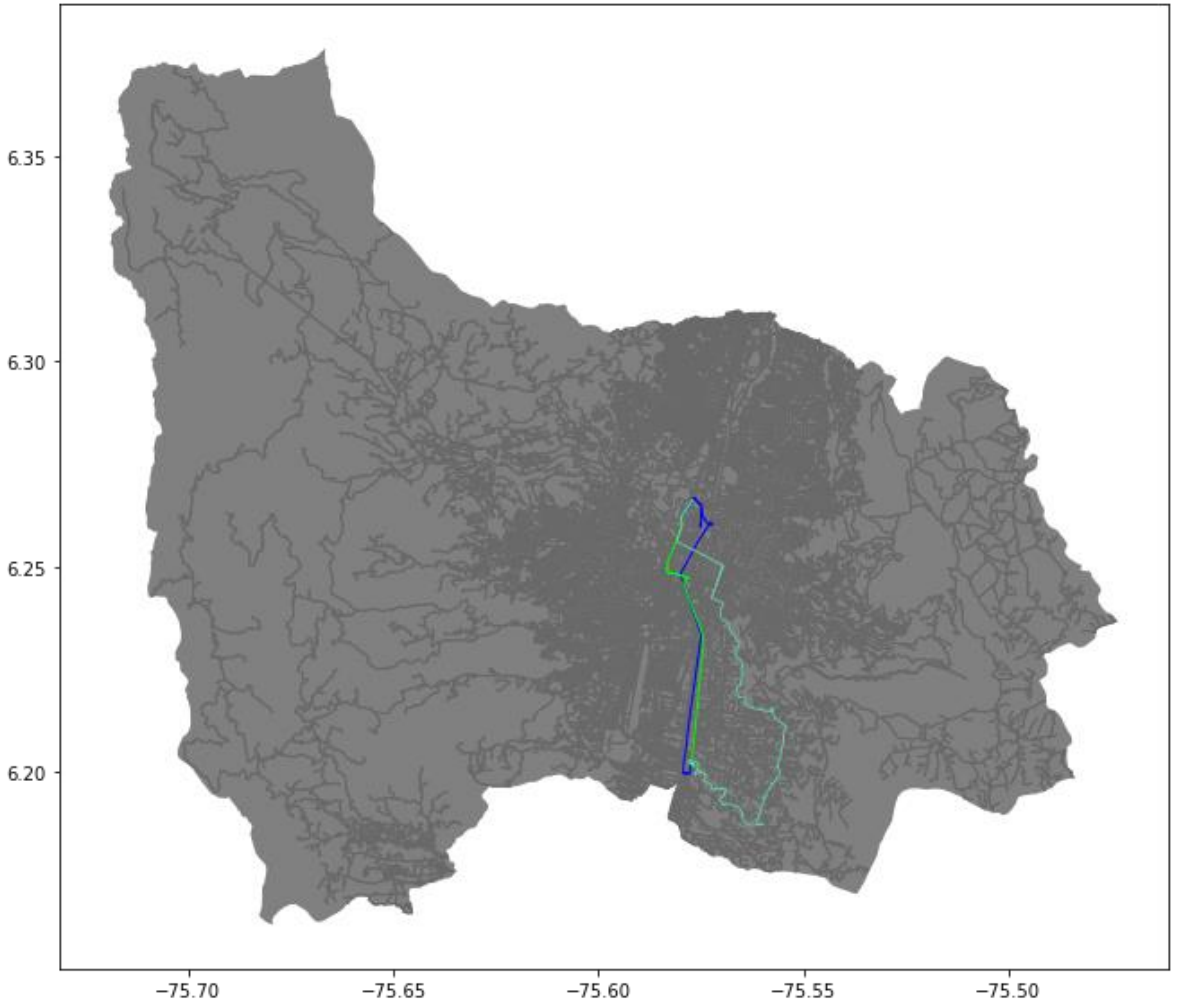
Distance and risk of harassment for the path that minimizes d = distance. Execution time of 0.1874 seconds, this is the fastest path but will most likely not be the safest option.

Third path minimizing d = ???

Origin	Destination	Distance (meters)	Risk of harassment (between 0 and 1)
EAFIT University	National University	12.464 m	0.69

Distance and risk of harassment for the path that minimizes d = both the risk and the distance. Execution time of 0.1367 seconds, this one will get you to your destination as fast as possible while taking into consideration the risk.

Visual comparison of the three paths



Future work directions

Databases

- Types of crime
- Relevant locations
- Safe places

Project 1

- Web application
- Graphic interface

Software Engineering

- Mobile application

Project 2

- Machine learning
- Updatable database

THANK YOU!

With the support of

The first author was supported by the Generación E grant. All authors are grateful to the Vice Rector's Office for Discovery and Creation, Universidad EAFIT, for their support in this research.