FINDING THE SHORTEST PATH PREVENTING SEXUAL HARASSMENT THROUGH ALGORITHMS

UNIVERSIDAD EAFIT

Presentation of the team

Juan Felipe Restrepo
Author

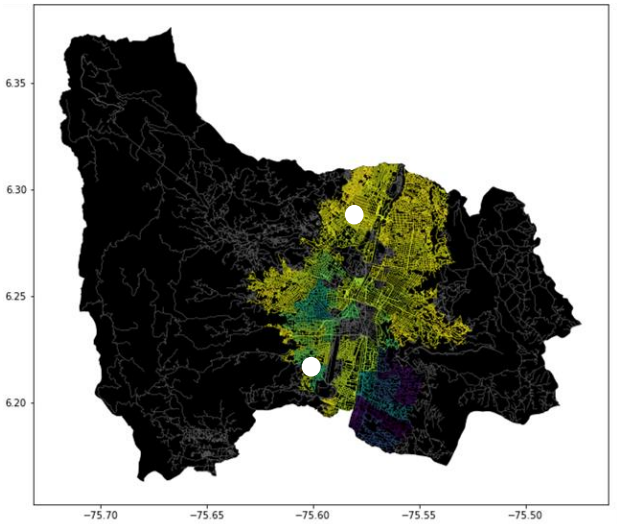
Sara Valentina Cortes
Author

Andrea Serna
Literature review

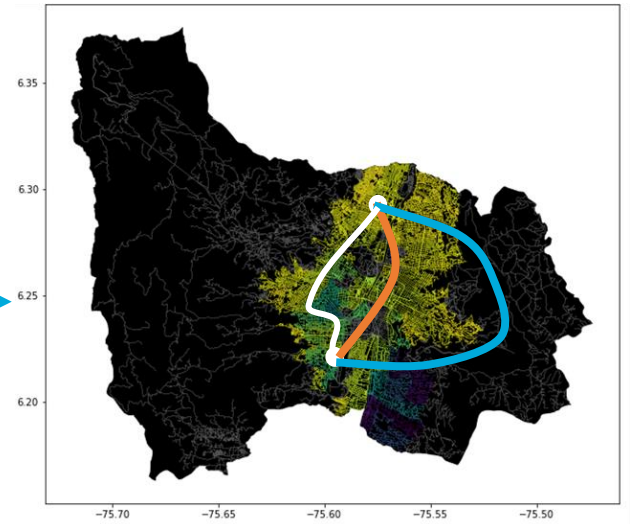
Mauricio Toro
Data preparation

https://github.com/JuanFelipeRestrepoBuitrago/ST0245

Problem Statement



Shortest path algorithm



Streets of Medellín, Origin and Destination

Three paths that reduce both the risk of harassment and distance

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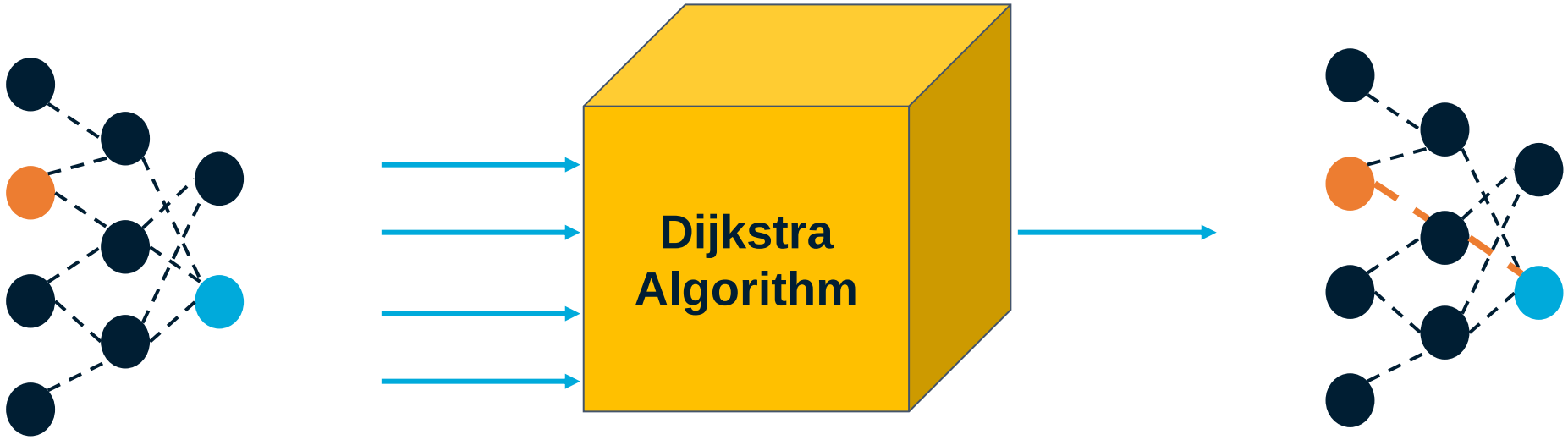
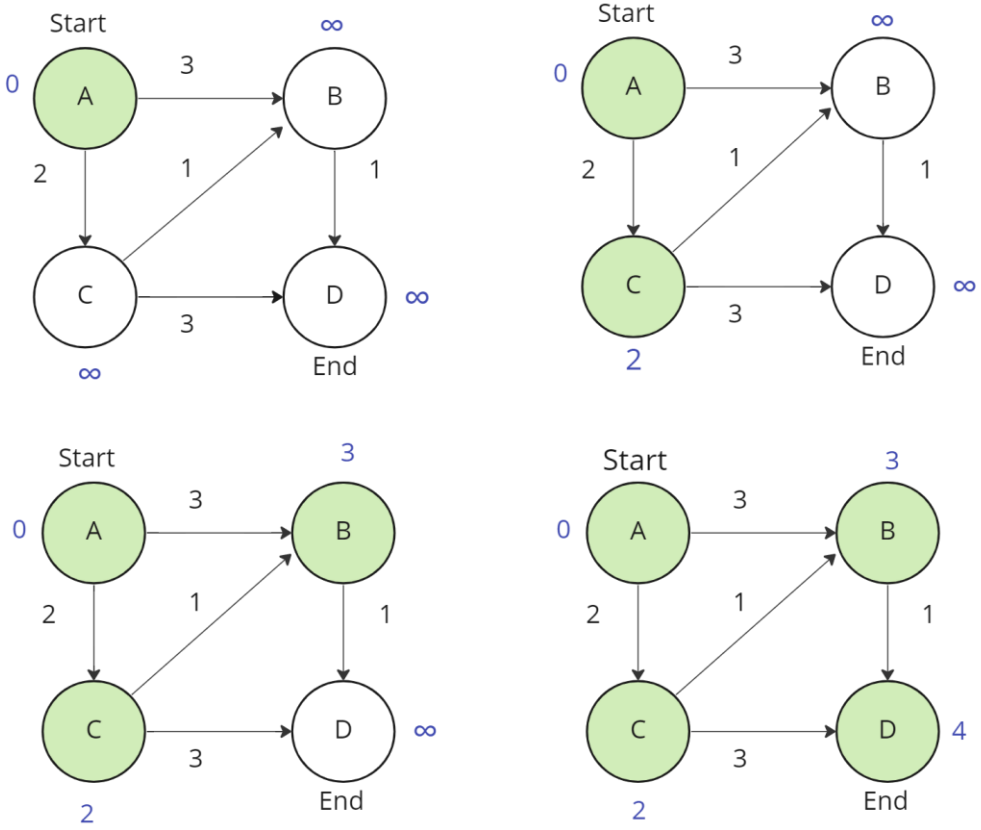
Solution Algorithm



Streets of Medellín, Origin and Destination

A path that reduces both distance and harassment

Explanation of the algorithm



Dijkstra Algorithm for the Shortest Path

Complexity of the algorithm

	Time complexity	Complexity of memory
Dijkstra	O((V+E) Log V)	O(V)

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

First path minimizing distance

Origin	Destination	Distance (meters)	Risk of harassment (between 0 and 1)
EAFIT University	National University	7686.62	0.71

Distance and risk of harassment for the path that minimizes distance. Execution time of 0,14 seconds.

Second path minimizing harassment risk = d^r

Origin	Destination	Distance (meters)	Risk of harassment (between 0 and 1)
EAFIT University	National University	11027.69	0.47

Distance and risk of harassment for the path that minimizes r = d^r . Execution time of 0,15 seconds.

Third path minimizing distance and harassment risk = d + r / 2

Origin	Destination	Distance (meters)	Risk of harassment (between 0 and 1)
EAFIT University	National University	7762.26	0.72

Distance and risk of harassment for the path that minimizes distance and harassment risk. Execution time of 0,19 seconds.

Visual comparison of the three paths

Path	Combination
Shortest	Distance only
Safe and Short	**d + r / 2**
Safest	**d^r**

Destiny: National University

Start point: EAFIT University

Future work directions

Databases

- Implement a Graph Database
- Consider other variables

Project 1

- Create a Web application

Software Engineering

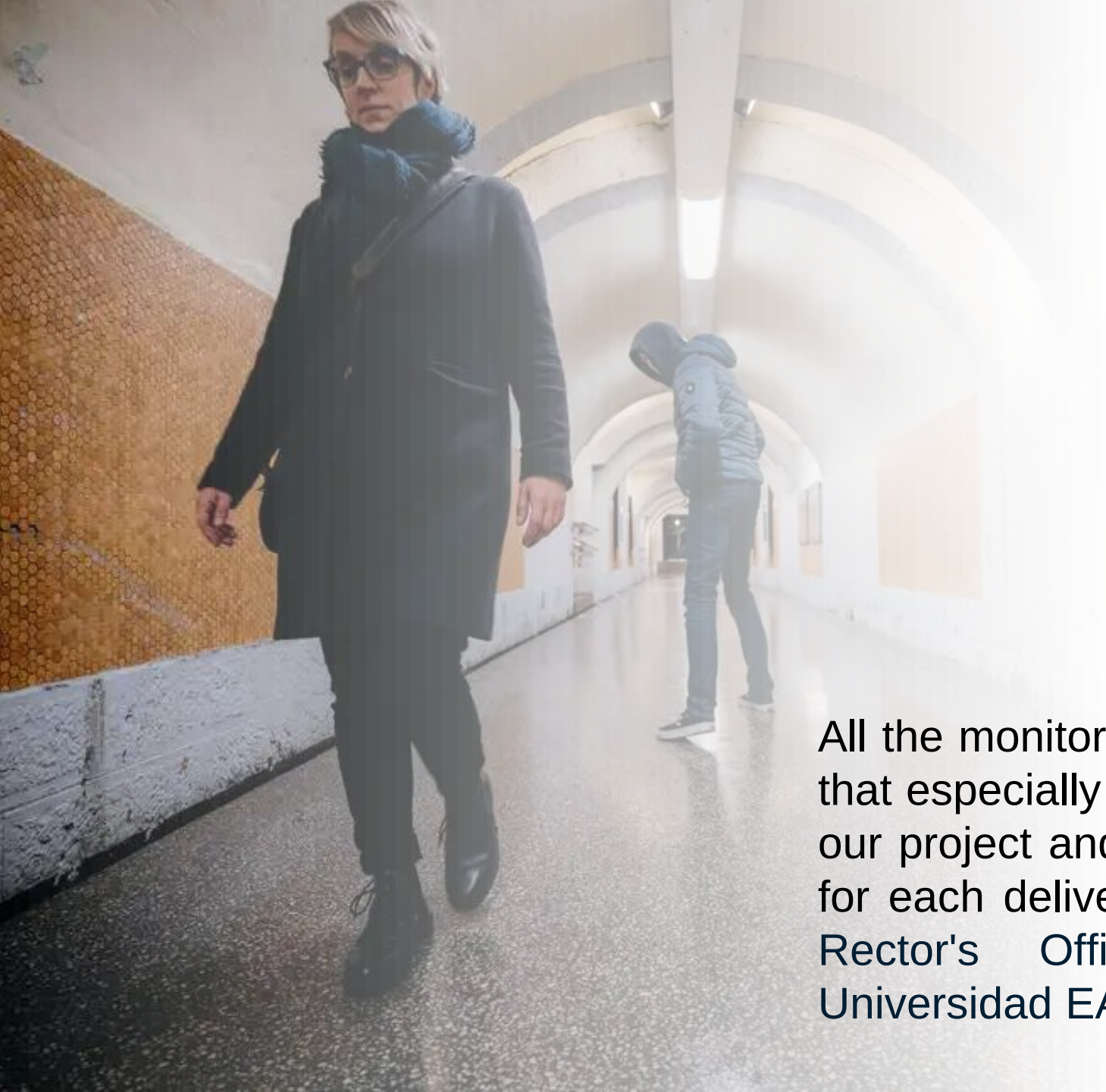
- Create a real time Mobile application

Project 2

- Implement ML Algorithms

Report accepted in OSF.IO

Sara V C Manrique, Juan F R Buitrago, Andrea Serna, and Mauricio Toro. 2022. Finding the shortest path preventing sexual harassment through algorithms. Retrieved from osf.io/qtj2c



THANK YOU!

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