SAFETY-BASED PATH FINDING ALGORITHM FOR REDUCTION OF SEXUAL HARASSMENT.

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

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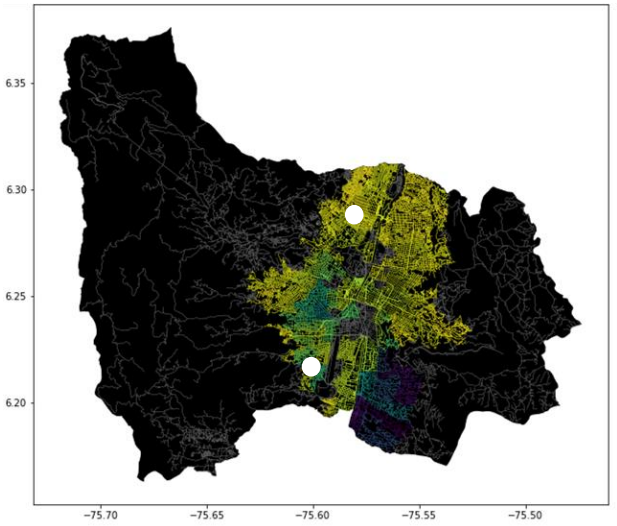
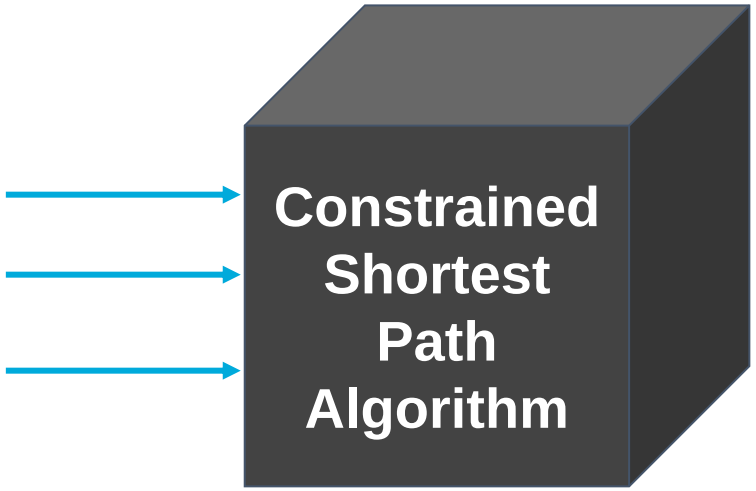
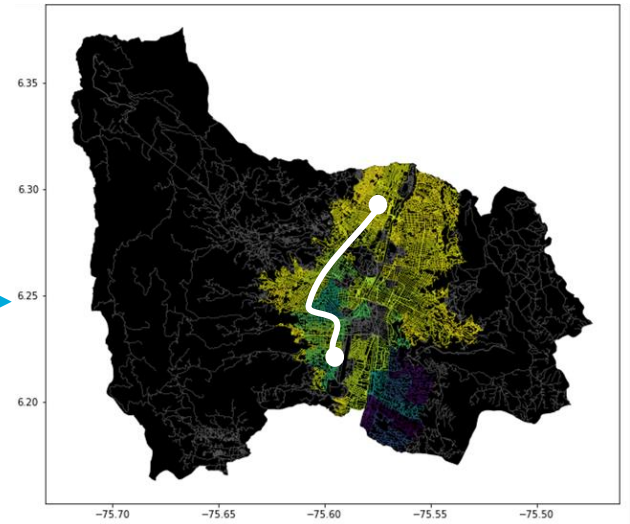
Problem Statement



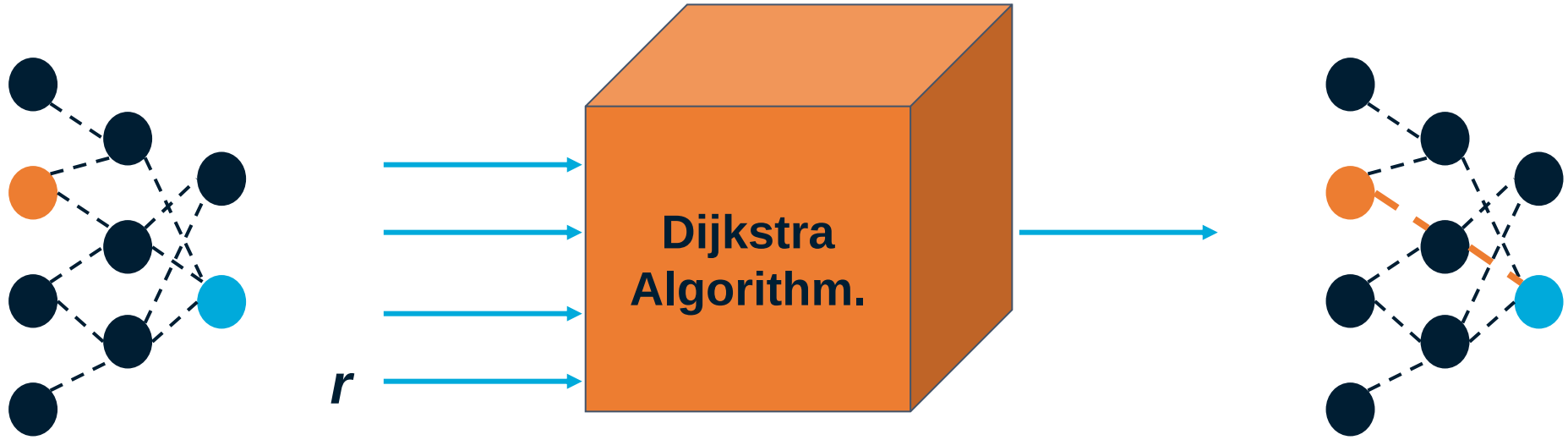
Streets of Medellín, Origin and Destination





Constrained Shortest Paths

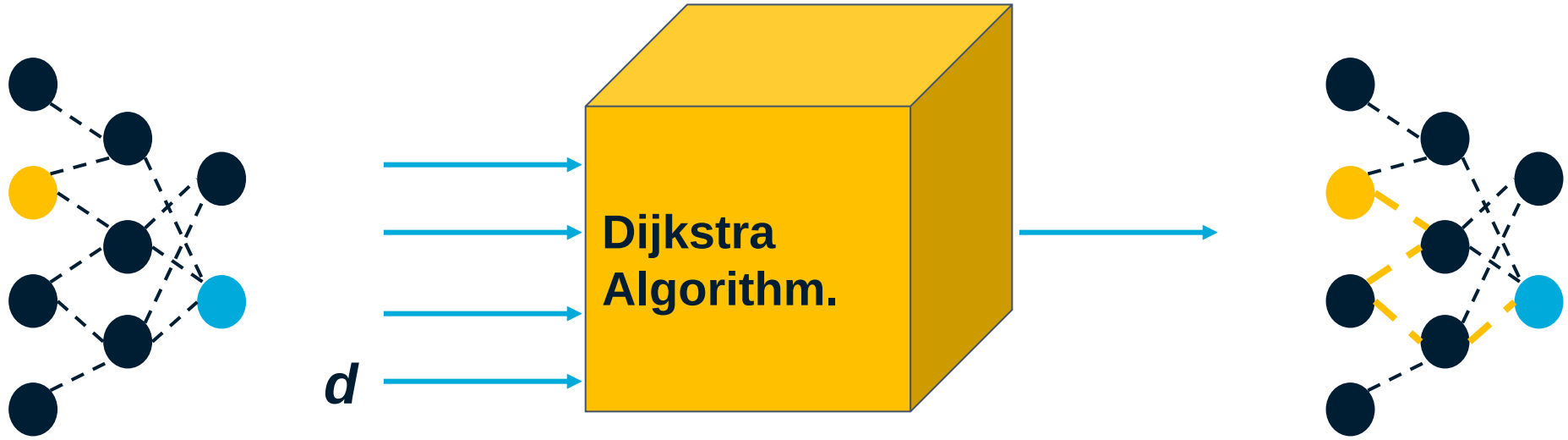
First Algorithm



Streets of Medellín, Origin and Destination

Shortest path without exceeding a weighted-average risk of harassment *r*

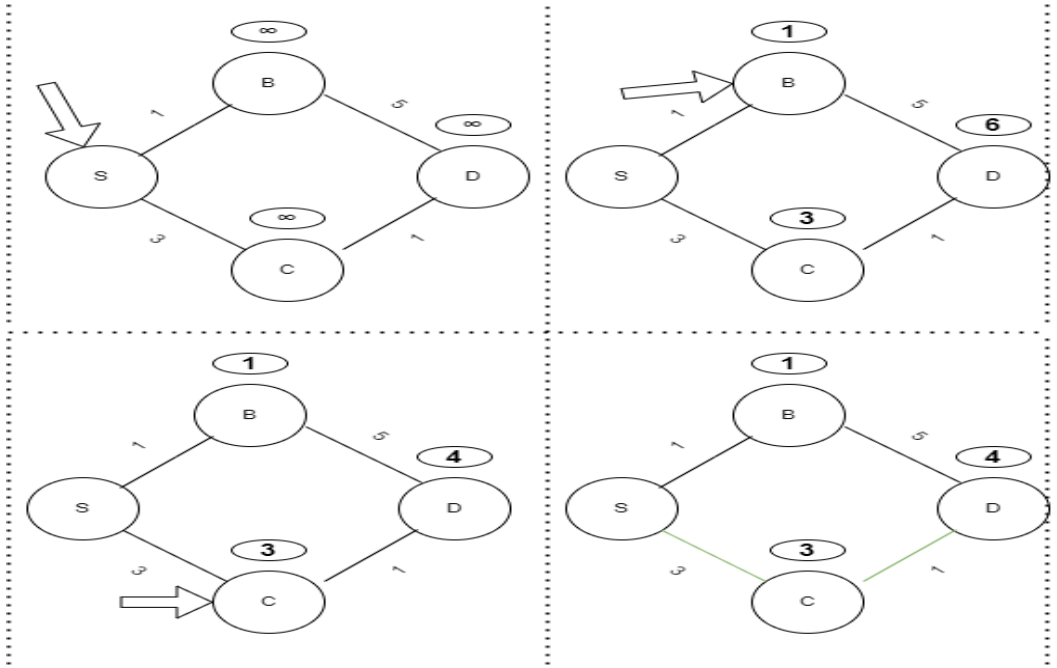
Second Algorithm



Streets of Medellín, Origin and Destination

Path with the lowest weighted-average risk of harassment without exceeding a distance *d*

Algorithm Explanation



Dijkstra Algorithm for the Constrained Shortest Path.

Algorithm Complexity

	Time Complexity	Memory Complexity
Dijkstra algorithm	$O(V + E \log E)$	$O(E \log V)$

Time and memory complexity of Dijkstra algorithm. V is the number of nodes and E is the number of edges.

Shortest Path Results

Origin	Destination	Shortest distance (meters)	Without exceeding a weighted-average risk of harassment
Universidad EAFIT	Universidad de Medellín	6130.017	0.84
Universidad de Antioquia	Universidad Nacional	2192.955	0.85
Universidad Nacional	Universidad Luis Amigó	1467.791	0.85

Shortest distance obtained without exceeding a weighted average risk of harassment *r.*

Lowest Risk Results

Origin	Destination	Weighted-average risk of harassment	Without exceeding a distance (meters)
Universidad EAFIT	Universidad de Medellín	0.7291	7000
Universidad de Antioquia	Universidad Nacional	0.8435	7000
Universidad Nacional	Universidad Luis Amigó	0.8514	6500

Lowest weighted-average risk of harassment obtained without exceeding a distance *d.*

Algorithm Execution Times

Execution Times

0.18 seconds

0.16 seconds

0.17 seconds

Future Work Directions

Probability

- Other risk estimations
- Probability maps

Optimization 1

- Biobjective optimization

Statistics 2

- MV risk estimations

S & M 4

- Traffic Estimation
- Simulate different situations for improving the algorithm.

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Report Accepted on OSF.IO

Julián Ramírez, Andrés Salazar, Simón Marín, Mauricio Toro. Energy and Storage Optimization in Precision Livestock Farming. Technical Report, Universidad EAFIT, 2021. https://doi.org/10.31219/osf.io/du8yt

THANK YOU!

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