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

UNIVERSIDAD EAFIT®

Samuel Rico
Author

Gregorio Bermúdez
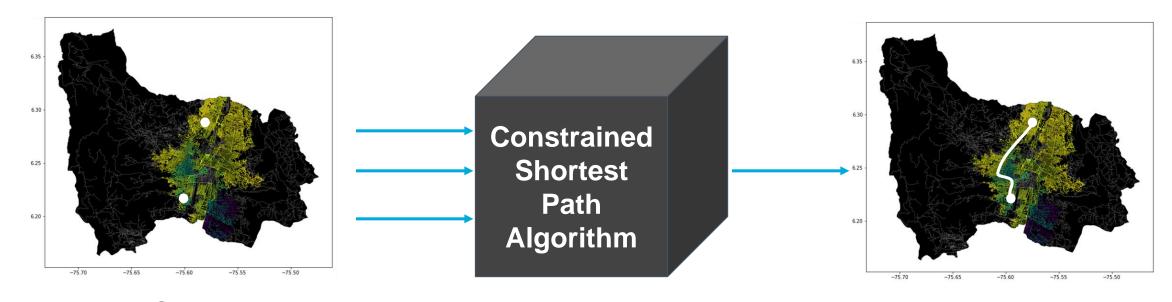Author

Andrea Serna
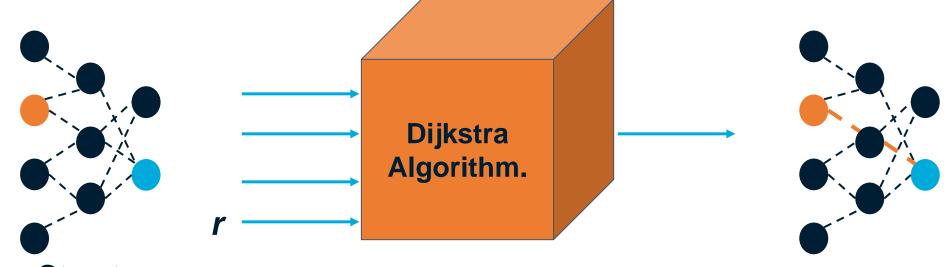Literature review

Mauricio Toro
Data preparation

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

UNIVERSIDAD EAFIT

Streets of Medellín, Origin and Destination

Constrained Shortest Path Algorithm

Constrained Shortest Paths

Streets
of Medellín,
Origin and
Destination

Dijkstra
Algorithm.

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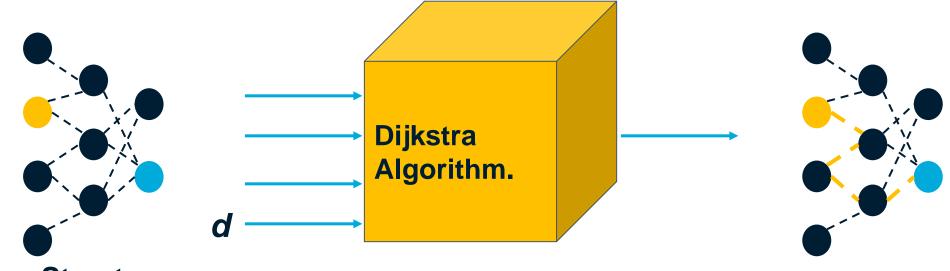
Shortest path without
exceeding a
weighted-average risk
of harassment r

UNIVERSIDAD **EAFIT**®

**Streets
of Medellín,
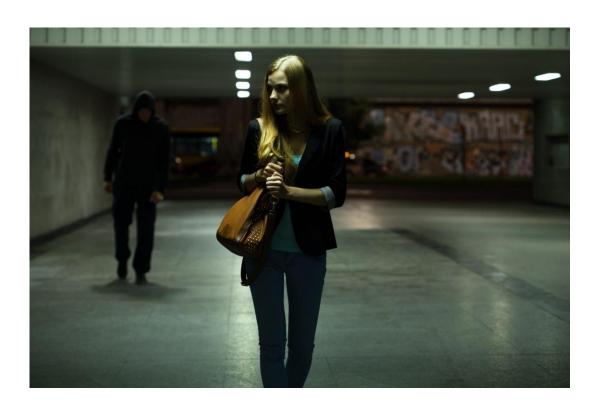Origin and
Destination**

d

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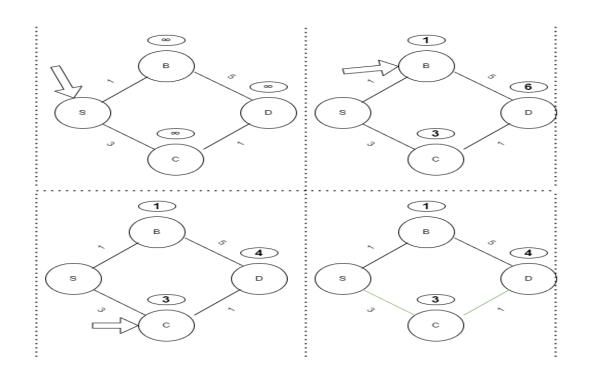
**Path with the lowest
weighted-average risk
of harassment without
exceeding a distance *d***

**UNIVERSIDAD
EAFIT®**

Dijkstra Algorithm for the Constrained Shortest Path.

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

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.*

🕐 **Execution Times**

UNIVERSIDAD EAFIT ➡️ **Universidad de Medellín** Ciencia y Libertad ➡️ **0.18 seconds**

UNIVERSIDAD DE ANTIOQUIA ➡️ **UNIVERSIDAD NACIONAL DE COLOMBIA** ➡️ **0.16 seconds**

UNIVERSIDAD NACIONAL DE COLOMBIA ➡️ **UNIVERSIDAD CATÓLICA LUISAMIGÓ** ➡️ **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.

UNIVERSIDAD EAFIT®

THANK YOU!

Supported by