Faster Shortest Path Computation for Traffic Assignment
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Introduction

- transportation forecasting model
- mathematically describes the behaviour of traffic
- people wish to travel on shortest path with least travel time
- goal: find a faster algorithm for solving the shortest path problem between origins and a destinations in transportation network

Traffic Assignment

- Traffic Assignment (TA) deals with selection of shortest path for everyone in the network to minimise their travel times
- a non-linear problem, travel times decrease dramatically when congestion happens
- an iterative algorithm called Path Equilibration (PE) algorithm is used to solve TA
- PE requires to find millions of shortest paths
- research of using PE for TA has just begun in recent years due to its huge computation memory requirement
- speed up TA and benefit transportation modelling
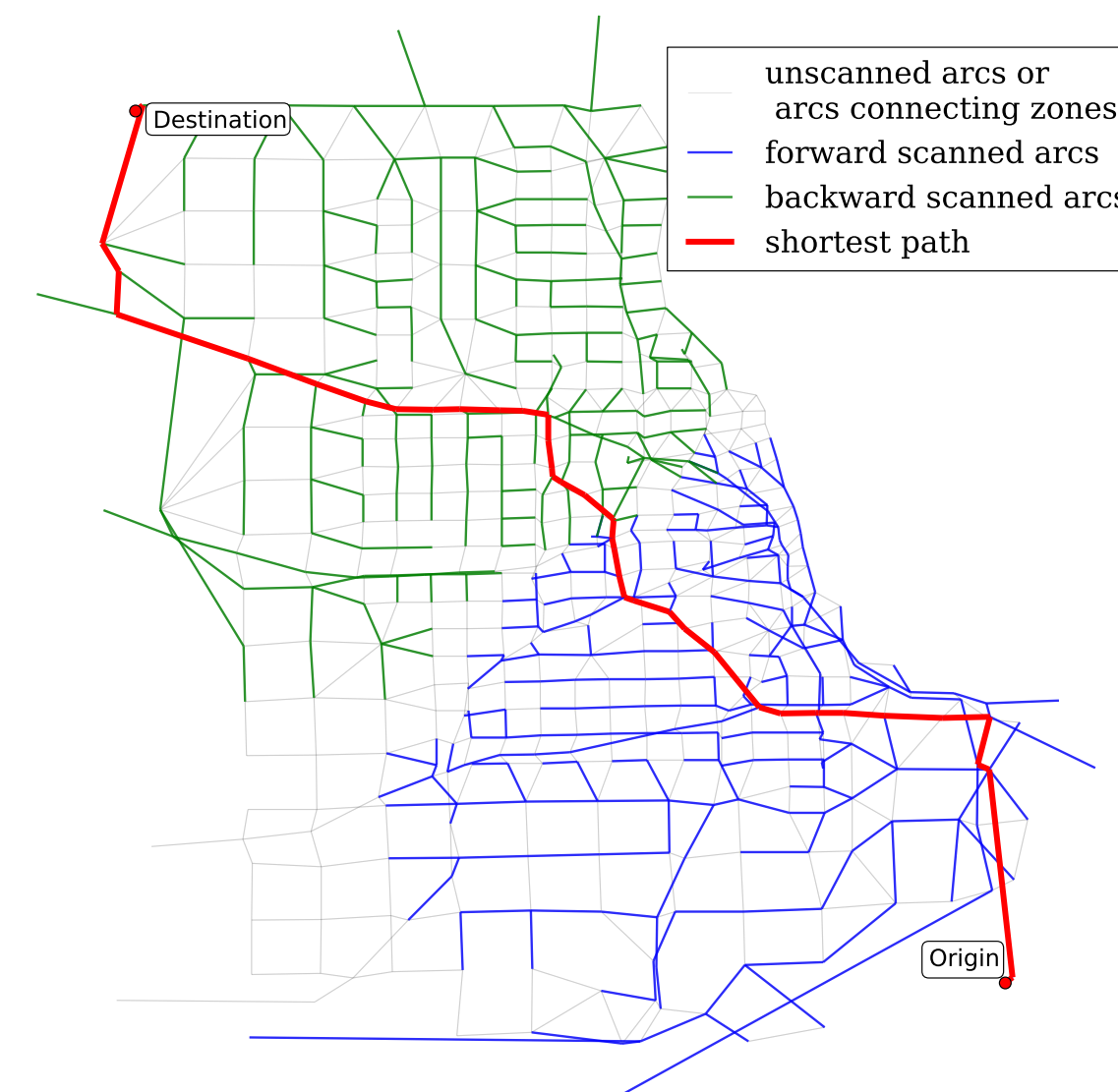
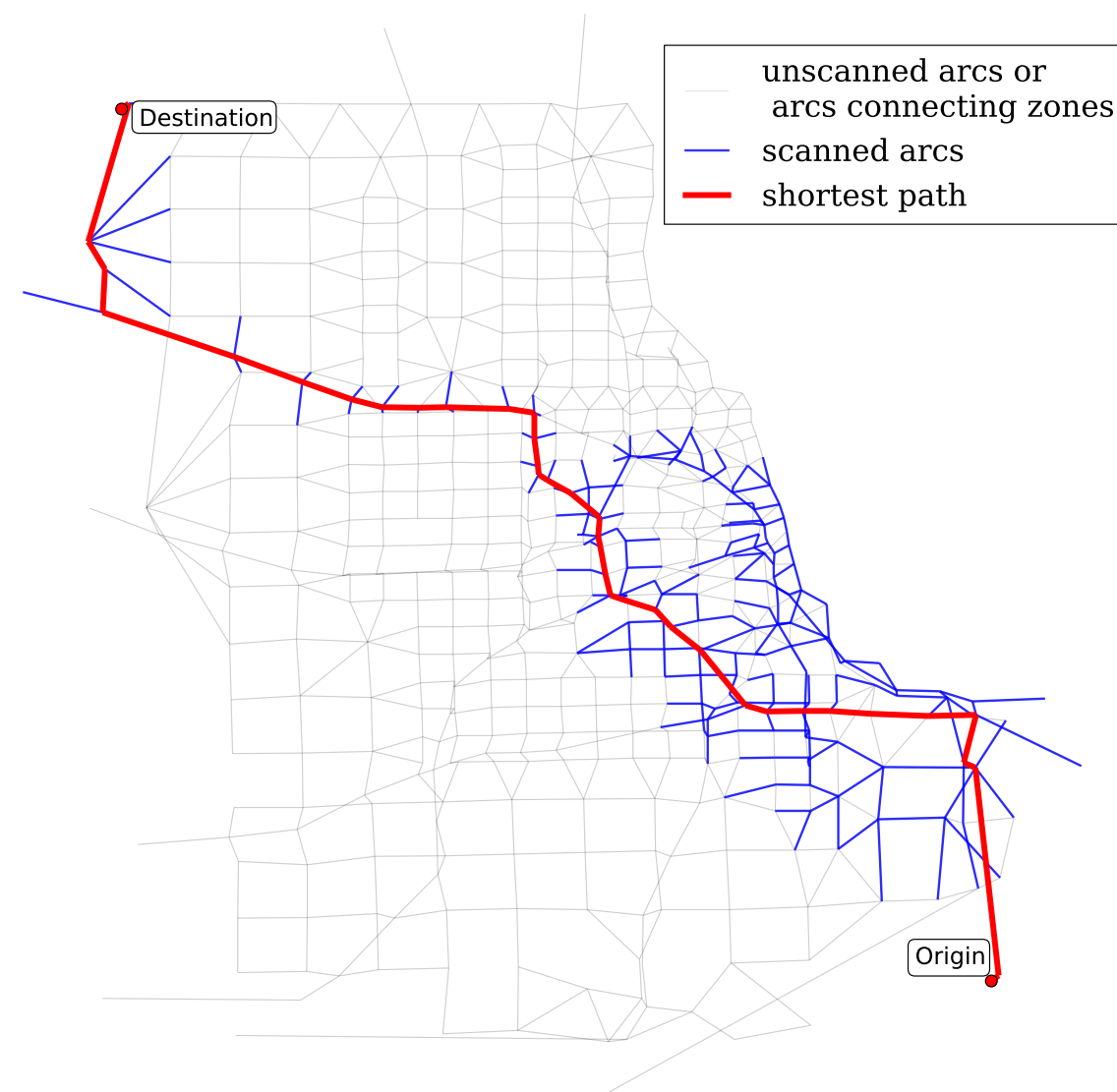## Shortest Path Algorithms

Dijkstra's algorithm
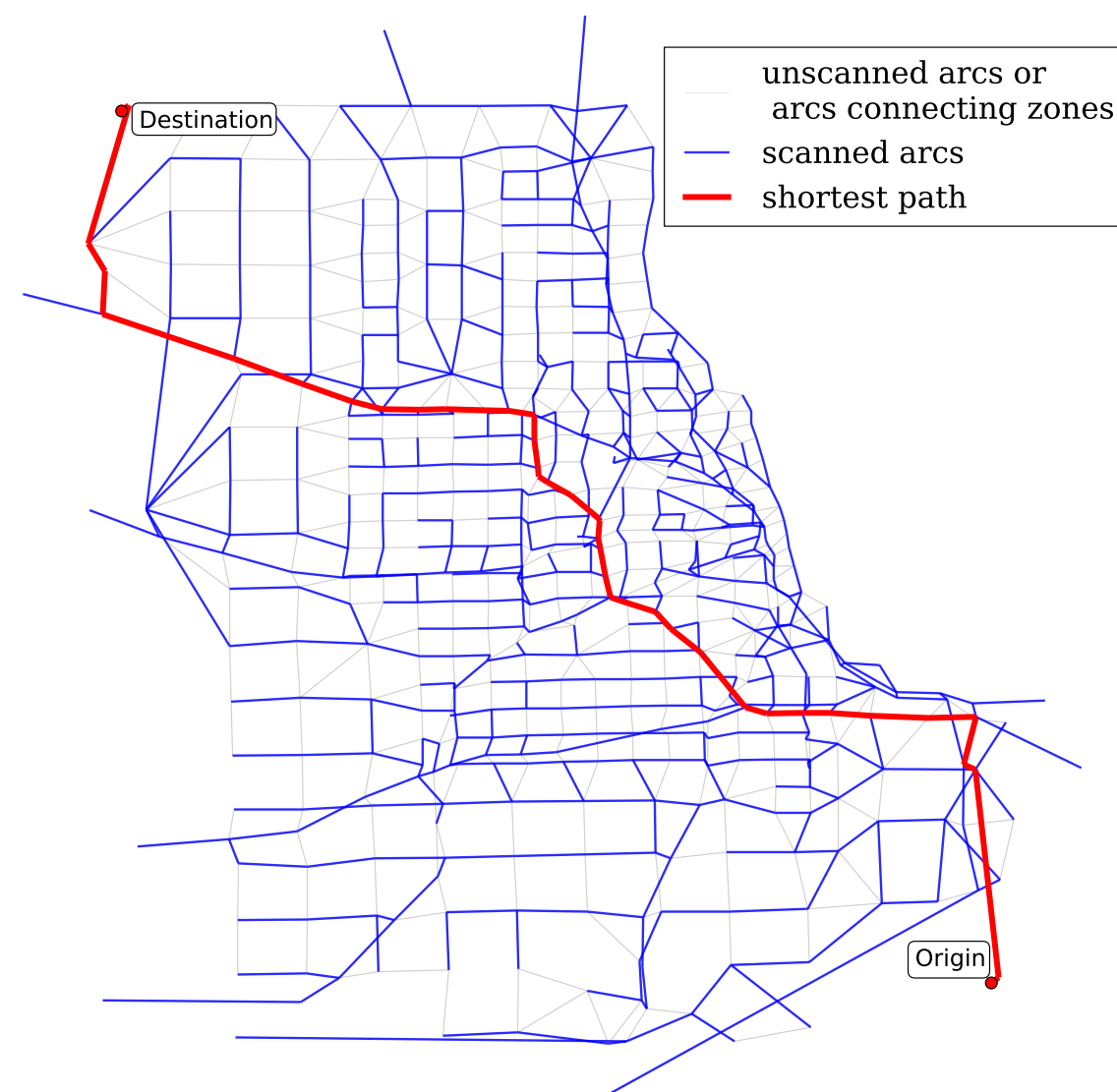
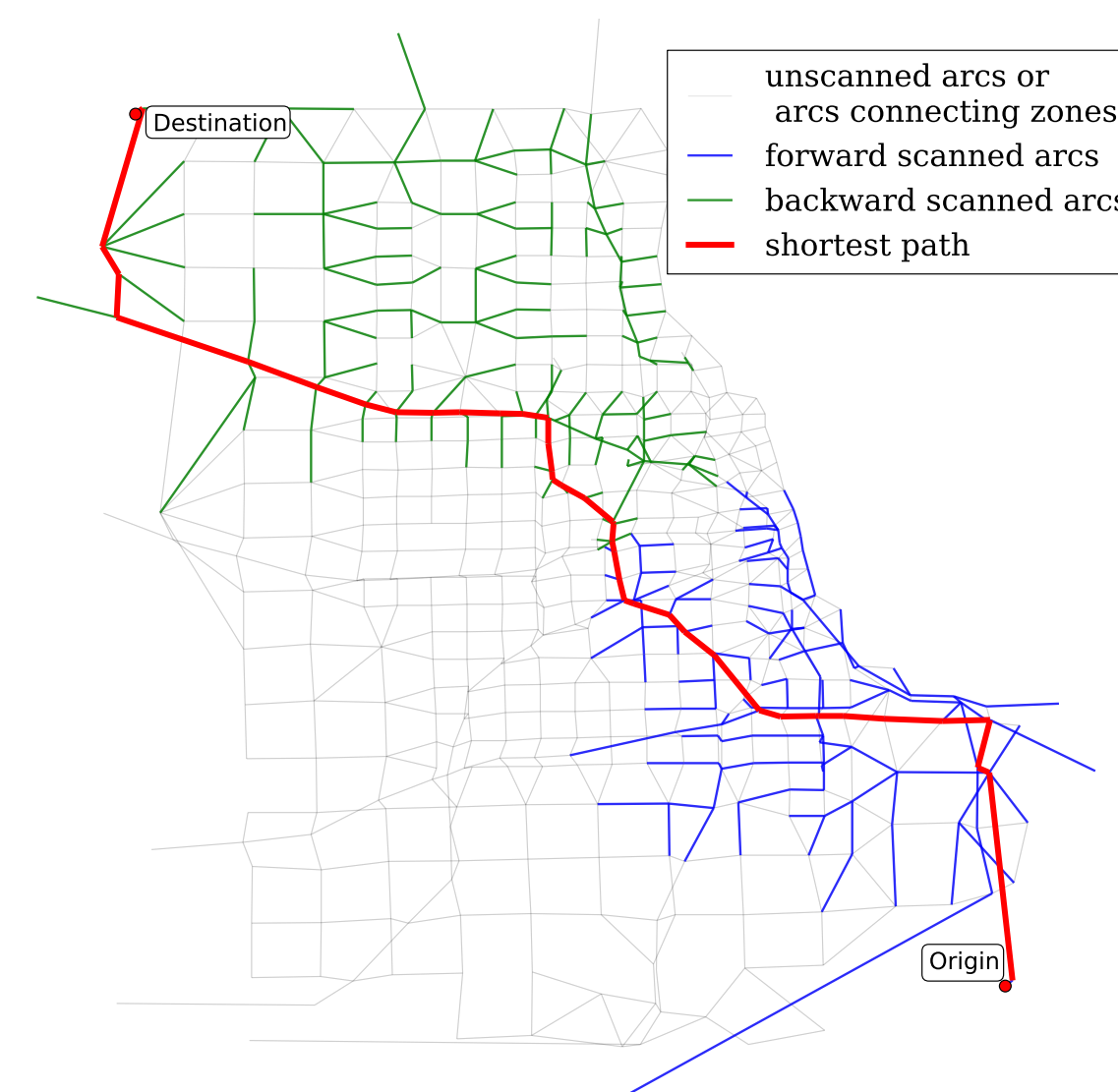searches the entire network

Bidirectional Dijkstra's algorithm

searches from both ends simultaneously

A* Search

searches along the expected shortest path

Bidirectional A* Search

searches along the expected shortest path from both ends simultaneously

Recommendations

Conclusions