

Public Transit Map-Matching with GraphHopper

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Chair of Algorithms and Data Structures

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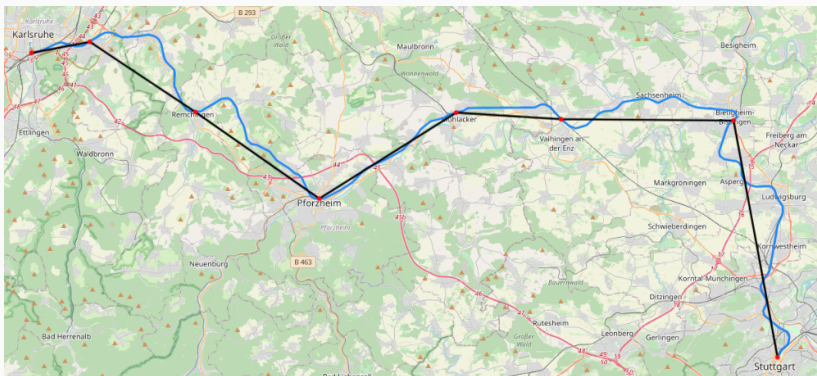


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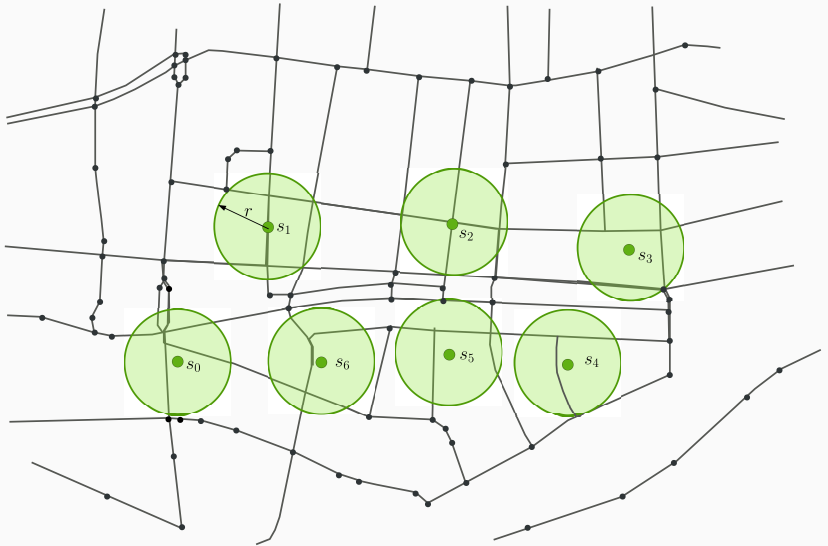
Live Demo

Approach

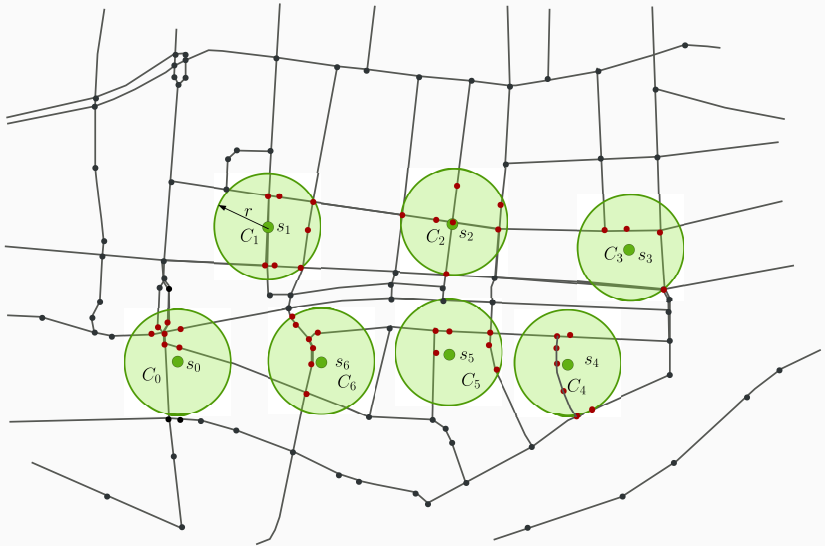
Approach



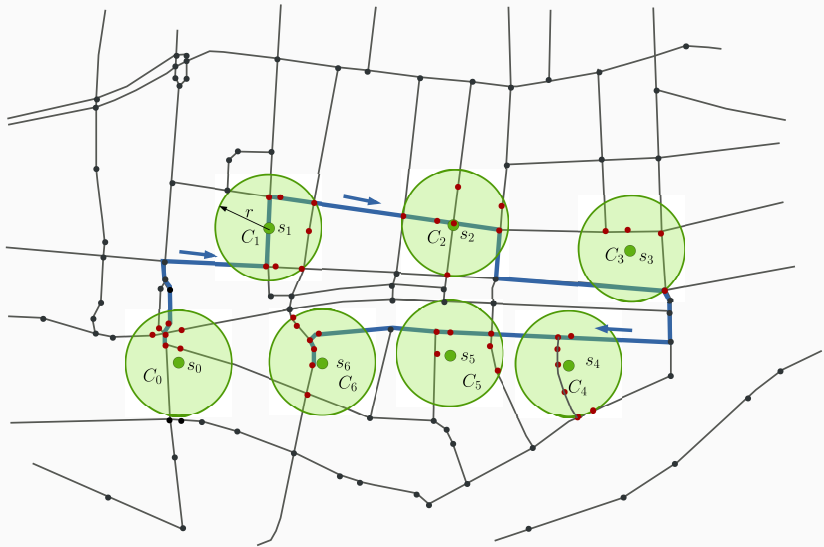
Approach



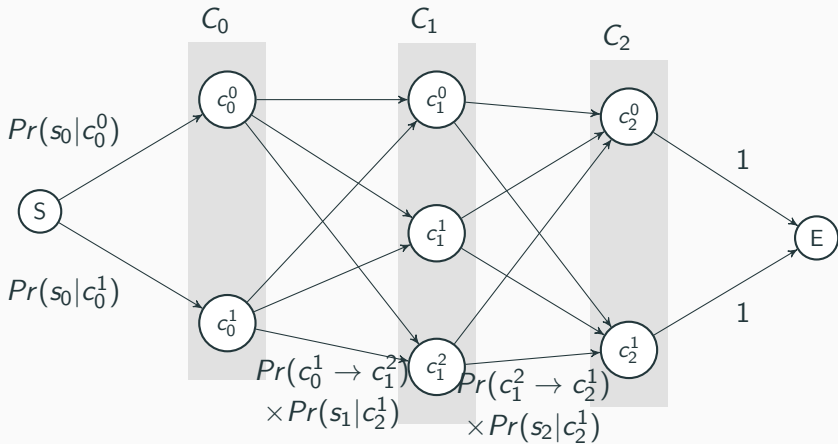
Approach



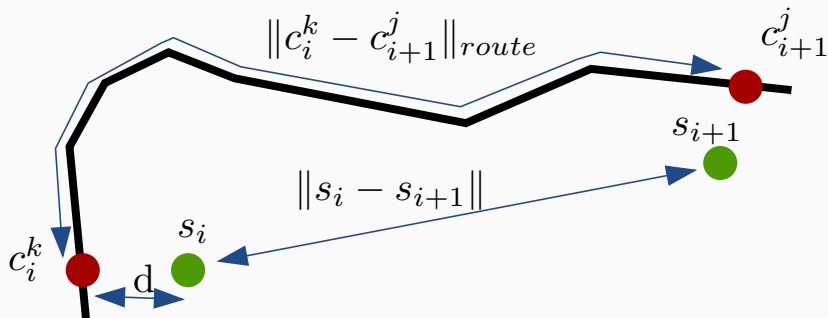
Approach



Find most likely sequence through Hidden Markov Model



Hidden Markov Model - Probabilities



$$d = \|s_i - c_i^k\|$$

$$p(s_i | c_i^k) = \frac{1}{\sqrt{2\pi}\sigma} e^{-0.5(\frac{d}{\sigma})^2}$$

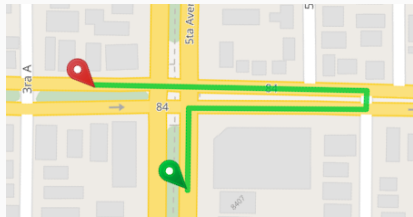
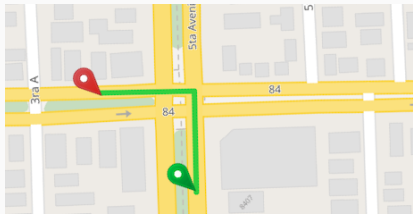
$$d_t = |\|s_i - s_{i+1}\| - \|c_i^k - c_{i-1}^j\|_{route}|$$

$$p(c_i^k \rightarrow c_{i+1}^j) = \frac{1}{\beta} e^{-\frac{d_t}{\beta}}$$

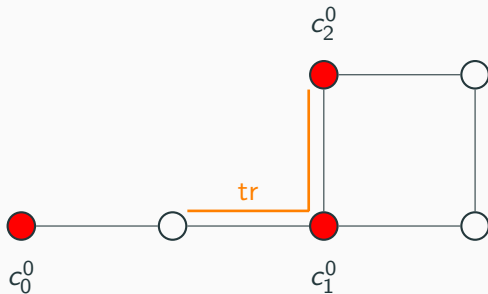
That's basically it

content...

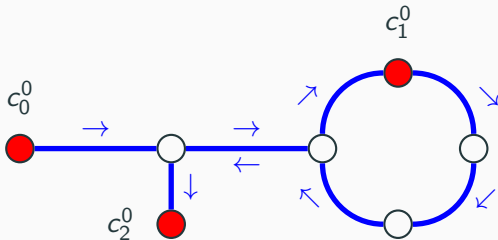
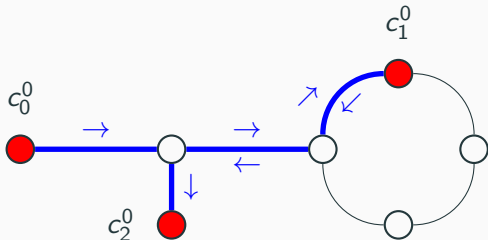
TRMM - Turn Restrictions



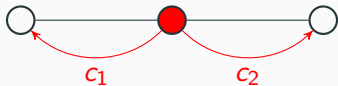
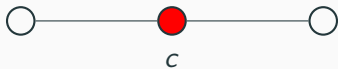
TRMM - Inter Hop Turn Restrictions



TRMM - Inter Hop Turn Restrictions

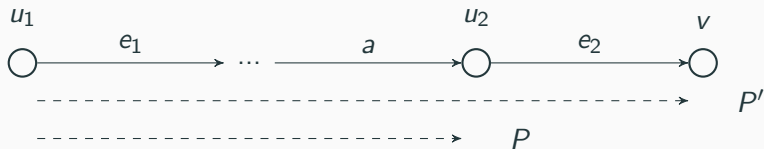


TRMM - Directed Candidates



TRMM - Path Finding with Directed Candidates

Candidates $c_1 = (u_1, e_1)$, $c_2 = (u_2, e_2)$



GraphHopper

Evaluation
