PROBABILISTIC GRAPH NEURAL NETWORKS
FOR TRAFFIC SIGNAL CONTROL

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Introduction

- Background
- Existing Methods
- Challenges
- Our model: TSC-GNN
Problem Definition

- Reinforcement Learning for Traffic Signal Control

\[ \langle S, O, A, P, R, \pi, \gamma \rangle \]
Our model: TSC-GNN

- Cooperation of traffic signals
- Variational Graph Inference
- Q-value Prediction
Experiments

• Datasets

(a) Gudang sub-district  (b) Dongfeng sub-district
Experiments

- Baselines
  1) FixedTime
  2) MaxPressure
  3) CGRL
  4) Individual RL
  5) OneModel
  6) Neighbor RL
  7) GCN
  8) CoLight
Experiments

• Results

<table>
<thead>
<tr>
<th>Model</th>
<th>$D_{Jinan}$</th>
<th>$D_{Hangzhou}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixedtime</td>
<td>869.85</td>
<td>728.79</td>
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<tr>
<td>MaxPressure</td>
<td>361.33</td>
<td>422.15</td>
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<td>CGLR</td>
<td>1210.7</td>
<td>1528.26</td>
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<tr>
<td>Individual RL</td>
<td>325.56</td>
<td>345.00</td>
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<td>OneModel</td>
<td>728.63</td>
<td>394.56</td>
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<td>Neighbor RL</td>
<td>1168.32</td>
<td>1053.45</td>
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<td>GCN</td>
<td>625.66</td>
<td>768.43</td>
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<td>CoLight</td>
<td>316.52</td>
<td>309.06</td>
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<tr>
<td>TSC-GNN</td>
<td><strong>291.24</strong></td>
<td><strong>281.19</strong></td>
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Thank you for listening!