Agent Behaviour in Peer-to-peer Shared Ride Trip Planning

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Introduction

In a peer-to-peer shared ride system, clients looking for a ride and negotiate with transportation hosts for optimal trips. Behavior of agents, Clients and Hosts, affect negotiation processes and cause distinct shared ride trips.

Hypothesis

Involving different behavior of agents, the shared ride trips will change significantly on the base of previous research, but mid-range communication strategy is still both efficient and effective compared to other communication strategies.

Immobile and Mobile Clients

Clients can insist on a geodetic route from departure to destination and wait for rides. Alternatively, they can leave the geodetic route and they can walk.

Figure 1. Shared ride systems are a solution of world-wide traffic problems.

Typical Hosts

To better reflect the properties of a realistic transportation system, three typical hosts are identified in a computer simulation. They differ from each other by attributes and behavior.

<table>
<thead>
<tr>
<th>Host Type</th>
<th>Capacity</th>
<th>Speed</th>
<th>Route</th>
<th>Detour</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass Transport vehicle</td>
<td>10</td>
<td>2</td>
<td>predefined</td>
<td>FALSE</td>
<td>timetable</td>
</tr>
<tr>
<td>Taxi Cab</td>
<td>1</td>
<td>1</td>
<td>changeable</td>
<td>TRUE</td>
<td>nil</td>
</tr>
<tr>
<td>Private Cab</td>
<td>1</td>
<td>1</td>
<td>predefined</td>
<td>FALSE</td>
<td>nil</td>
</tr>
</tbody>
</table>

Results

Figure 2. Mass transport with parallel (case 1) and overlapping (case 2) bus line – trip distance 10

Outlooks

This experiment demonstrates types of agents enhance the quality of trip planning under the quickest criterion. Multiple optimization criteria, such as a relatively cheap and quick trip, are developing. Future research also includes competition among clients.

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