Motion Pattern Recognition for Lane Change Prediction

OBJECTIVE
- Forward-looking maneuver planning for safe & comfortable HAD driving
- HAD vehicle must be able to detect & anticipate human driving behavior
- Early lane change detection to recognize cut-in maneuvers

APPROACH
- Create a memory: Learn typical lane change courses from real highway data
- Prediction: Compare driving behavior of traffic participants with learned prototypes and utilize best match for maneuver classification and motion prediction

RESULTS
- Average prediction time $\Delta T$ of a lane change maneuver is 1.65 s before lane crossing

<table>
<thead>
<tr>
<th>Approach</th>
<th>TPR</th>
<th>prec</th>
<th>$F_1$</th>
<th>$\Delta T$ (s)</th>
<th>Misclassification</th>
</tr>
</thead>
<tbody>
<tr>
<td>LCL</td>
<td>0.95</td>
<td>1.0</td>
<td>0.976</td>
<td>1.65</td>
<td>0.16</td>
</tr>
<tr>
<td>LCR</td>
<td>0.87</td>
<td>0.97</td>
<td>0.946</td>
<td>1.33</td>
<td>0.23</td>
</tr>
</tbody>
</table>