张翔宇工作汇报（2022.08.03）

过去工作总结

1.论文阅读

《A Mobile Telematics Pattern Recognition Framework for Driving Behavior Extraction》

数据集：一家欧洲保险公司收集的大规模数据集，数据集包含 50,000 次行程（20 次行程 × 2500 名司机）

创新之处：

（1）选定了五种当前流行的聚类算法，通过比较，最终确定最适合对当前数据集进行分类的聚类算法。

（2）确定最佳聚类数量

（3）从数据集中提取驾驶行为。每个集群是一组时间序列数据和原始数字

（4）根据每个集群的平均v,平均a,然后对照其他论文中相关驾驶行为的描述，对每个集群进行归类

Cluster number	Frequency Percentage (%)	Average speed (km/h)	Average acceleration (m/s^2)	Acceleration std	Name	Patterns of behavior
17	16.49%	1.961	-0.108	0.088	Warm stopping	Drivers in this group drive at low speeds with low deceleration and are prone to stopping.
29	9.08%	45.808	0.353	0.202	Cornering with medium speed	During cornering behavior, y- acceleration is close to zero. x-acceleration is high with significant standard deviation [2].
13	6.68%	50.550	0.333	0.022	Driving at normal speed	Drivers proceed at normal speed with very low acceleration and standard deviation.
8	5.18%	39.130	0.011	1.288	Swerving at medium speed	While swerving, x- and y-acceleration both have a high peak and high standard deviation [1].
2	4.96%	80.925	0.002	2.225	Weaving at high speed	There is high variation in between x- and y-acceleration. y-acceleration is very smooth over an extended period. The standard deviation of acceleration is high, but with a low mean [3].
11	4.59%	87.621	0.1114	0.163	Cornering at high speed	During cornering, speeds are high and x-acceleration increases rapidly over a short period of time, while y- acceleration is almost zero [3].

《Benchmarking Lane-changing Decision-making for Deep Reinforcement Learning》

创新之处：

（1）相比于在路上进行测试既昂贵又低效，本文使用了虚拟场景进行测试。（通过CARLA构建虚拟测试场景）

（2）测试分为了：随机性测试和确定性测试

（3）最后进行对比验证时，随机场景的评定标准为：平均速度，平均换道次数，平均最大加速度，成功运行的平均episode时间和所有测试episode平均通过距离；确定场景评定标准为：车道更改安全率，车道更改成功率和平均最大加速度

2.实践任务

（1）Nuscenes数据集的使用

（2）CARLA中用DQN实现路径规划：搭建环境类

未来计划

1.在CARLA中复现DQN

2.复现论文《Benchmarking Lane-changing Decision-making for Deep Reinforcement Learning》