ITS Modeling and Simulation Homework:1

ITS 小组

2019 年 9 月 27 日

1 Traffic Monitoring

Problem 1

Please download at least one segment of the NGSIM dataset and read the manual. Then, please plot some trajectories. If you could, please write some codes to plot the bird view of the studied road traffic.

Data: Next Generation Simulation I-80

Example:

No	Field Name	Example1(N0.10)	Example2(No.1000)
1	Vehicle_ID	1	2
2	Frame_ID	21	453
3	Total_Frames	884	415
4	Global_Time	1113433137000	1113433180200
5	Local_X	17.2890	6.2440
6	Local_Y	59.4630	190.4520
7	Global_X	6042841.107	6042813.977
8	Global_X	2133128.871	2133257.415
9	Vehicle_Length	14.3000	15.3000
10	Vehicle_Width	6.4000	6.4000
11	Vehicle_Class	2.0000	2.0000
12	Vehicle_Velocity	13.0000	29.5500
13	Vehicle_Acceleration	4.4300	11.2000
14	Lane_Identification	2.0000	1.0000
15	Preceding_Vehicle	0	44.0000
16	Following_Vehicle	0	17.0000
17	Spacing	0	100.4900
18	Headway	0	3.4000

图 1——图 2：Bird View of Trajectories :

图 1 颜色表示车道；图 2 颜色表示速度。

图 3——图 8：交通时空图:

由于有 7 个车道，如果同时将 6 车道的时空图画出，会有交叉（同向会车）发生。这里将不同的车道分别绘制时空图，如下所示, 其中颜色表示速度。时空图同样说明，距离驶入口越近的车道，受并入车辆的影响越大，相比而言，内车道基本不受影响。

注：为了比较，将大于 $45Km/h$ 的置为统一的颜色。

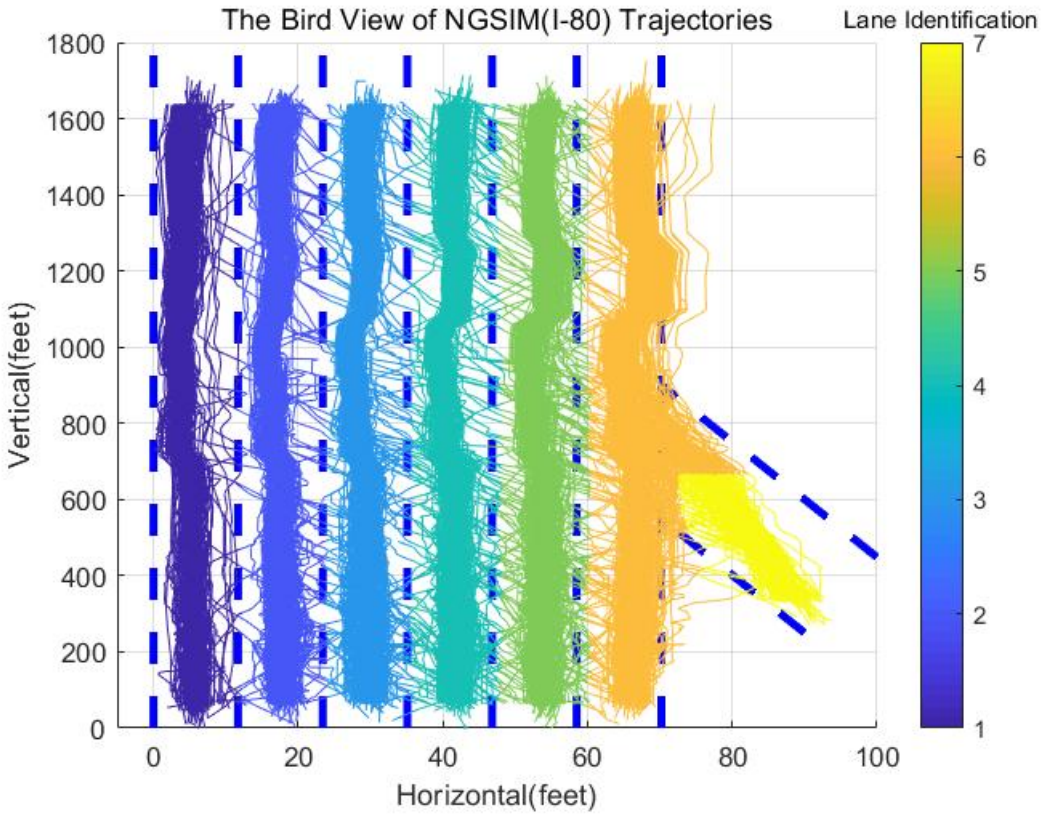

图 1: Bird View: Color Represents The Lane.

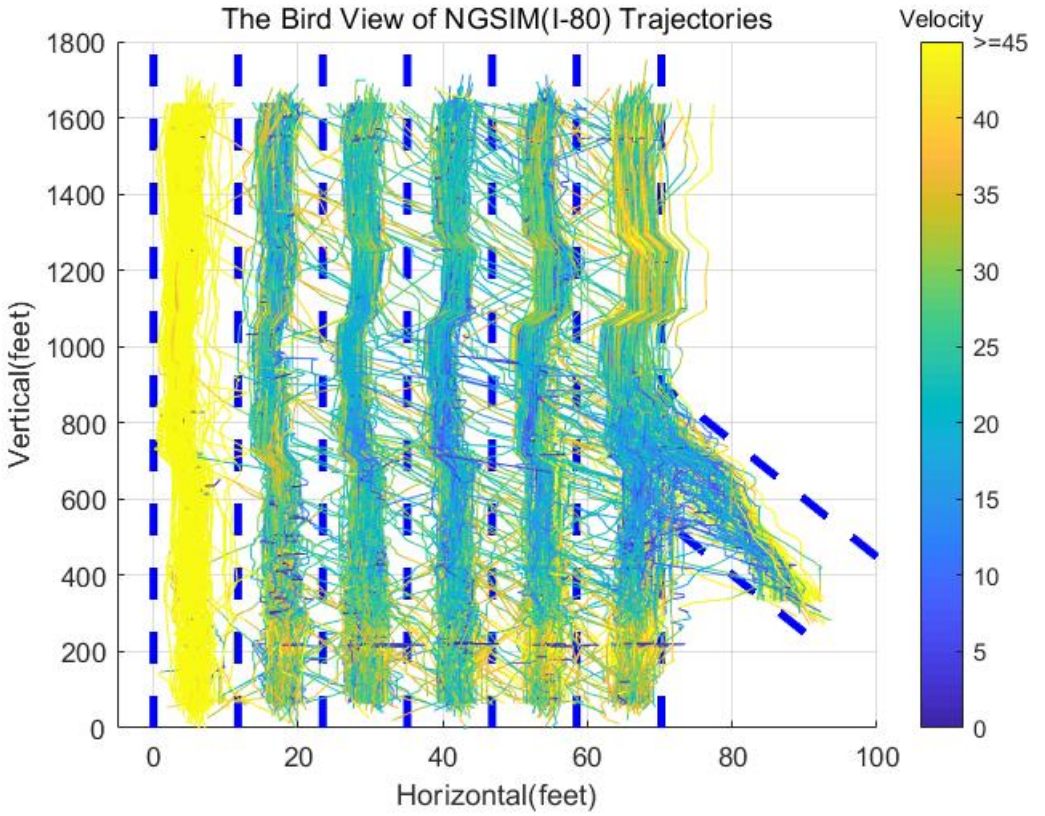

图 2: Bird View: Color Represents The Velocity.

图 2 表明，内车道速度要明显高于其他车道；由于车辆的并入，经过驶入口的车辆会有明显的减速，同时为了避险，有频繁的换道行为发生。

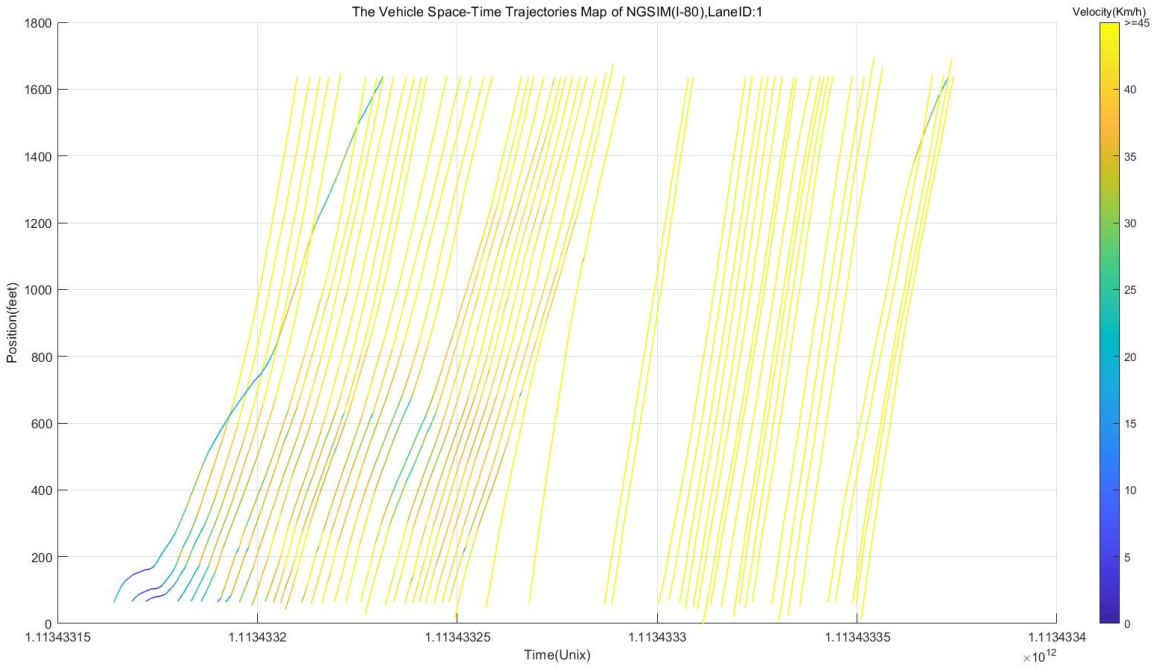

图 3: The Space-Time Trajectories Map Of Lane 1.

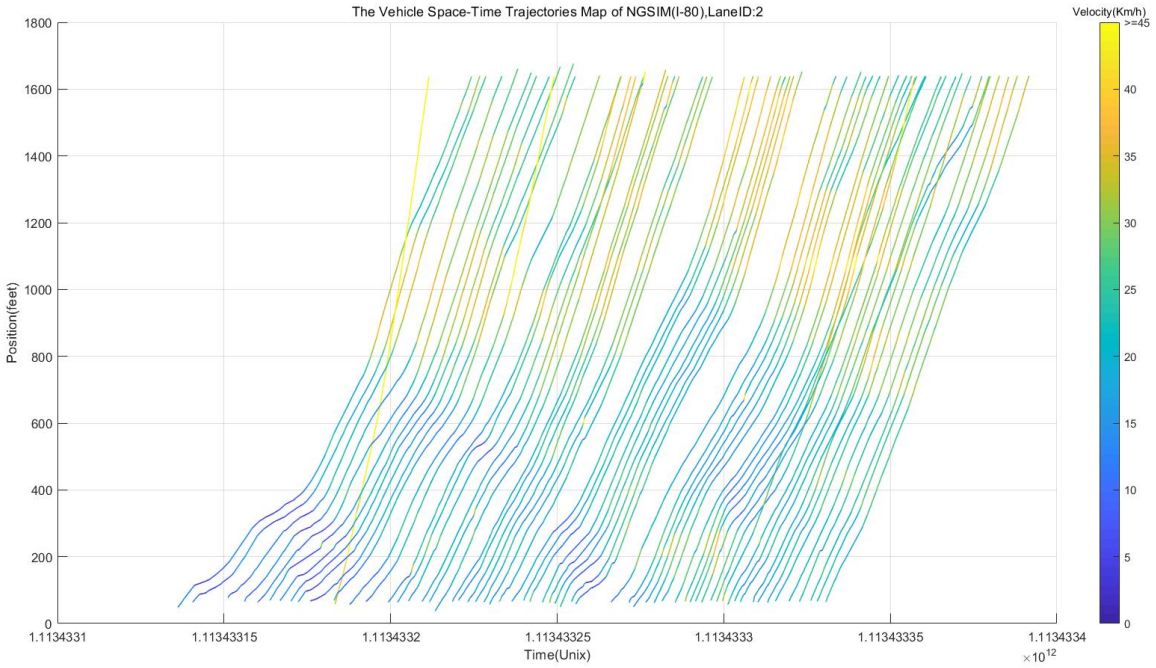

图 4: The Space-Time Trajectories Map Of Lane 2.

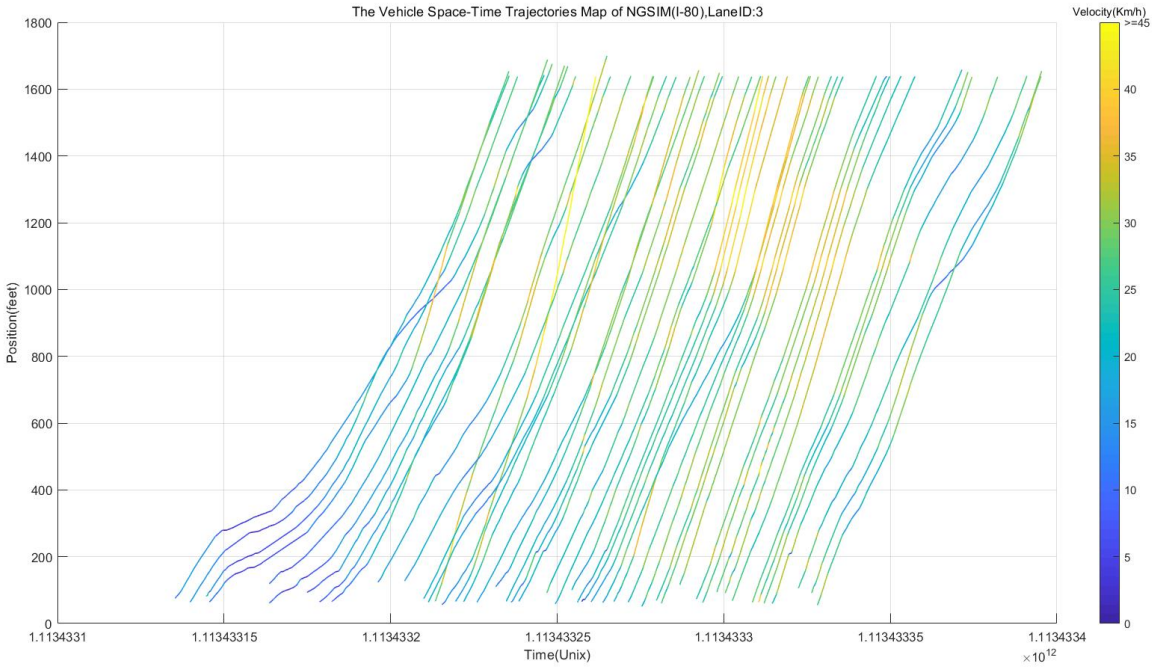

图 5: The Space-Time Trajectories Map Of Lane 3.

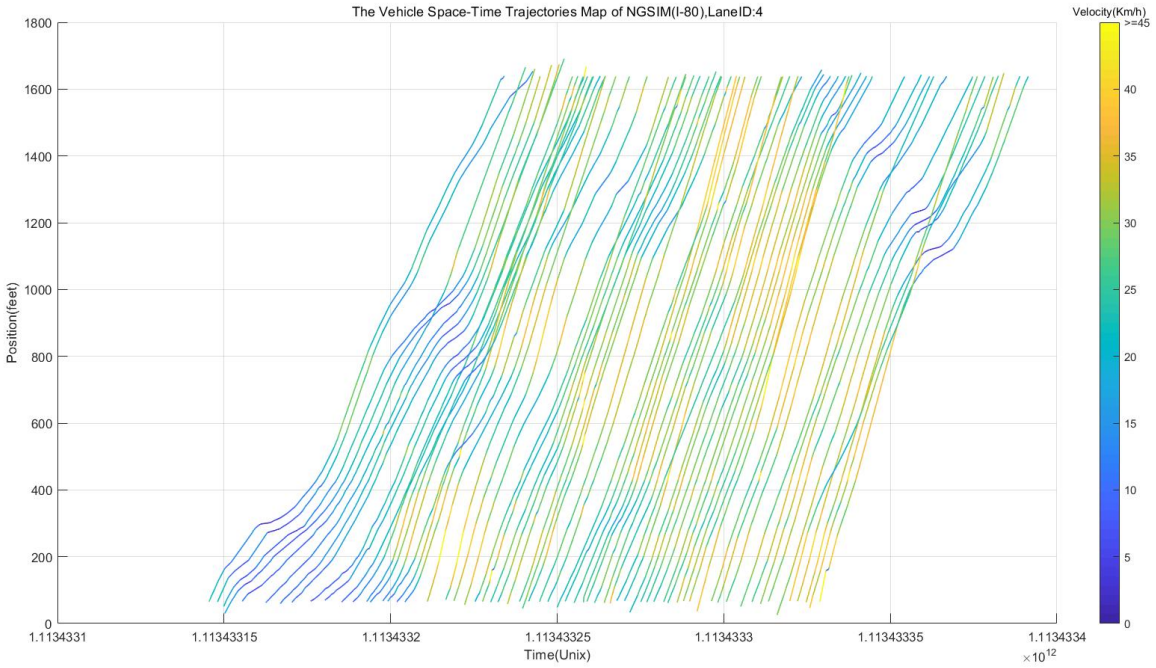

图 6: The Space-Time Trajectories Map Of Lane 4.

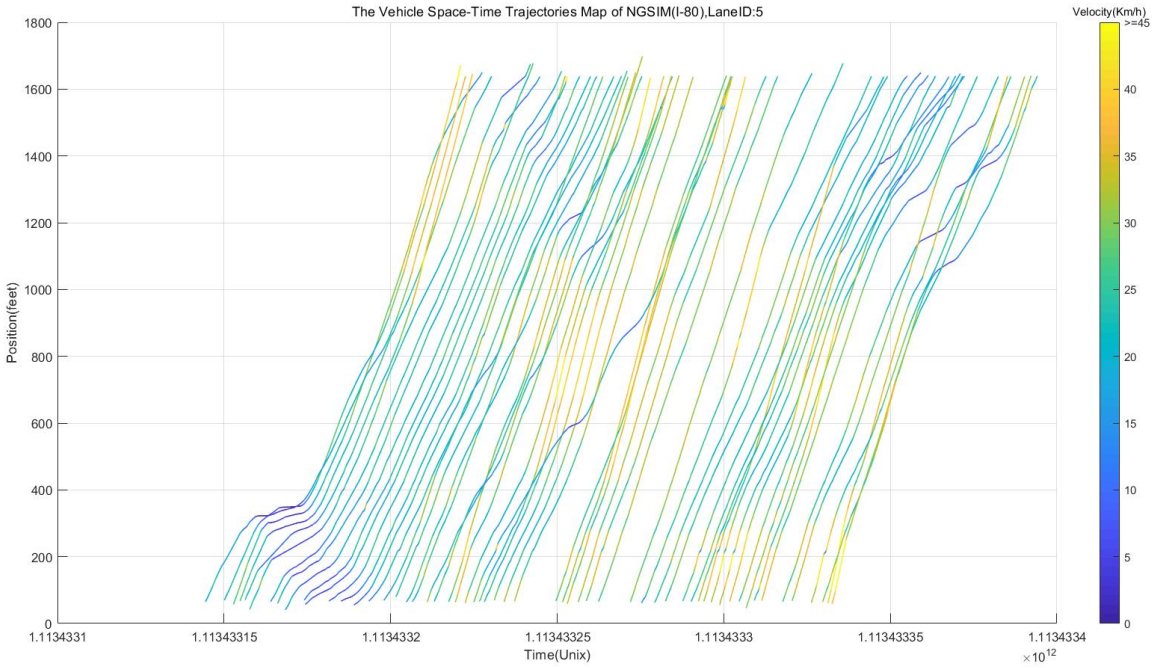

图 7: The Space-Time Trajectories Map Of Lane 5.

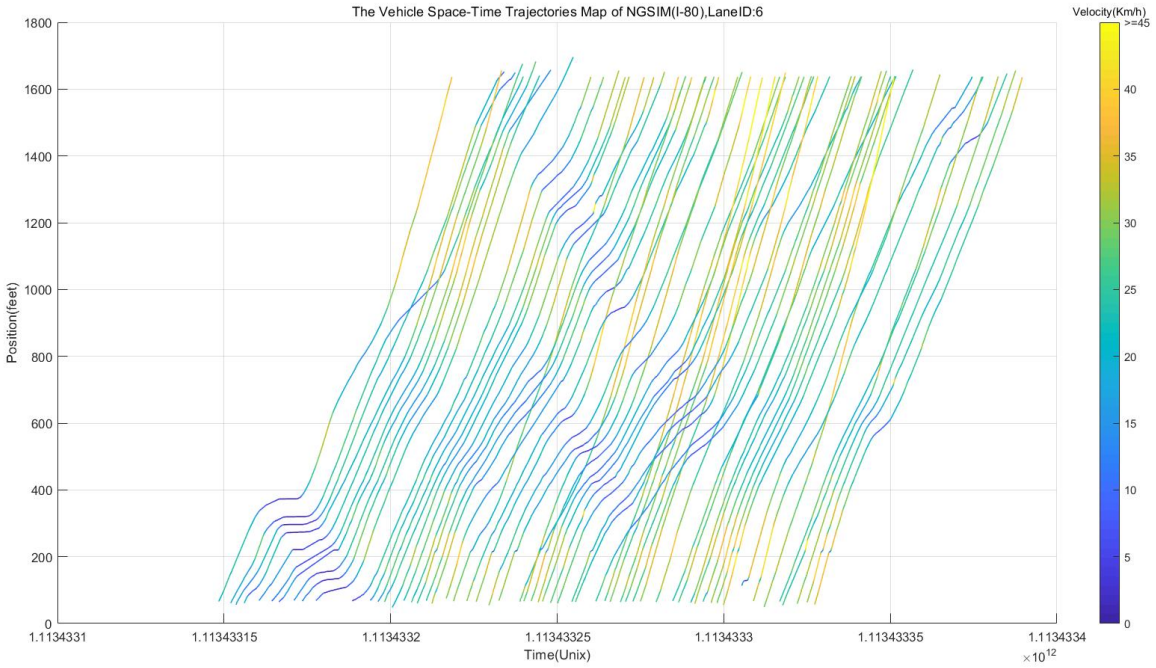

图 8: The Space-Time Trajectories Map Of Lane 6.