survey(lane-merging, passing order):

1. Modeling Vehicle Merging Behavior in Work Zone Merging Areas During the Merging Implementation Period(https://ieeexplore.ieee.org/document/7289423), 2016
Keywords: classification and regression tree (CART) method, work zone merging areas, the times to collision (TTC)
Summary: This paper presents a model determining whether merges or not using the CART (classification and regression tree) method. First, they collect the data at a work zone merging area in reality. Then, they use the CART method to build a model based on speed, distance, vehicle type, merging decision, and TTC (time to collision), a variable that they use to measure safety. The CART is basically a serial of 'if something then A, else B' that leads to merging or not in the end.

2. A Novel Lane Merging Framework with Probabilistic Risk based Lane Selection using Time Scaled Collision Conehttps://ieeexplore.ieee.org/document/8500652, 2018
Keywords: motion planning framework, dense traffic, Highway Merging, T-junction Merging, lane selection

3. Hierarchical Optimal Maneuver Planning and Trajectory Control at On-Ramps With Multiple Mainstream Lanes(https://ieeexplore.ieee.org/document/9764649), 2022
Keywords: Hierarchical Optimal Maneuver Planning and Trajectory Control at On-Ramps With Multiple Mainstream Lanes, on-ramp merging
Summary: This paper proposes a maneuver planner and an operational trajectory controller for an on-ramp scenario with two main lanes and one on-ramp lane. For the maneuver planner, three motion maneuvers are used, which are the car-following, cruising, and cooperative lane-changing maneuvers. The car-following maneuver is applied for vehicles whose directly preceding vehicle is already the target vehicle. The cruising maneuver is for leading vehicles of each lane. The cooperative lane-changing maneuvers is for vehicles whose directly preceding vehicle is not yet the target vehicle. With these maneuvers, they have parameters for relative speed, gap, acceleration, status, etc., in order to make the maneuver planner. Note that the parameters are all about the relations between each vehicle and its directly preceding vehicle. The maneuver planner is a model that optimizes dynamic vehicle sequences by minimizing disturbances upstream traffic and it can be restricted to lane-changing times or lane-changing directions.

4. A Multi-Class Lane-Changing Advisory System for Freeway Merging Sections Using Cooperative ITS(https://ieeexplore.ieee.org/document/9667335) 2021
Keywords: on-ramp merging, linear quadratic regulator (LQR)

5. The Traffic Characteristics of Three-Merge-One Road with Cellular Automaton Model(https://ieeexplore.ieee.org/document/7488684), 2016
Keywords: three-merge-one road, buffer lane length, Traffic Characteristics and simulations

6. An Efficient On-Ramp Merging Strategy for Connected and Automated Vehicles in Multi-Lane Traffic(https://ieeexplore.ieee.org/document/9316925), 2021
Keywords: On-ramp merging, DDDQN With Prioritized Replay, TIME-ENERGY OPTIMAL CONTROL, lane selection, reinforcement learning

7. Spatial characteristics of merging decision making and implementation at highway work zone(https://ieeexplore.ieee.org/document/8047904), 2017
Keywords:
Three issues are concerned: the desired merging positions, the mechanism of merging decision-making and the successful merging position, spatial characteristics
Summary:
This paper is helpful for Machine learning. It conducted an experiment to have the statistics to analyze each factor's(the desired merging positions, the size of merging gaps, the speed of the leading and following cars, etc.) significance in the work zone scenario. The first step is to get the statistics of the desired merging positions(the drivers performed when no cars are around). The second is to get the statistics of the merging performances when cars are around and compare it with the statistics in the first step. Then, make a model composed of the coefficients for each factor indicating the significance of them. The third step is to find the relations between factors and the successful merging positions(the positions after merging).

8. To Merge Early or Late: Analysis of Traffic Flow and Energy Impact in a Reduced Lane Scenario(https://ieeexplore.ieee.org/document/8569407), 2018
Keywords: merging late could be beneficial when done in a coordinated manner
Summary:
This paper analyzes the effect of the late-merging strategy in a non-cooperative manner, while it has been claimed by the recent papers that it is beneficial in a cooperative manner. The Intelligent Driver Model and a kinematics-based gap model are employed for the simulations in this paper. The Intelligent Driver Model is for human-like car following so it's simple and only requires little input and follows the 2-second rule. The kinematics-based gap model is for lane changing and the concept is that the preceding vehicle will accelerate and the following vehicle will decelerate to create a bigger gap, and then the merging vehicle will decelerate and merge. The vehicles in the simulations are either conservative vehicles or aggressive vehicles, where an aggressive vehicle means it only merges late. The result shows that the late-merging strategy is beneficial to fuel consumption and vehicle flow only when the aggressive-vehicle rate is lower than 25% and benefits the most at 20% rate.

9. Quantitative Driver Acceptance Modeling for Merging Car at Highway Junction and Its Application to the Design of Merging Behavior Control
(https://ieeexplore.ieee.org/document/8936516) 2019
Keywords: highway junction, decision-making characteristics of drivers,

10. Evaluation of lane-merging approaches for connected vehicles(https://ieeexplore.ieee.org/document/8813802), 2019
Keywords: The Grand Cooperative Driving Challenge GCDC, Simulation of Urban Mobility (SUMO), protocol, simulations of GCDC 2016, default of SUMO, and variation of the GCDC interaction protocol

11. Traffic Simulation of Lane-Merging of Autonomous Vehicles in the Context of Platooning(https://ieeexplore.ieee.org/document/8656856), 2018
Keywords: platoons,

12. A Ramp Merging Strategy for Automated Vehicles Considering Vehicle Longitudinal and Latitudinal Dynamics(https://ieeexplore.ieee.org/document/9231331), 2020
Keywords: enter the main lane with little speed difference, on-ramp, QP (Quadratic Programming) model, discretized space technique, not related to survey

13. Optimal Trajectory Planning of Connected and Automated Vehicles at On-Ramp Merging Area(https://ieeexplore.ieee.org/document/9565856), 2021
Keywords: optimal trajectory, smooth lane-changing, Legendre pseudo-spectral algorithm, on-ramp, CACC, not related to survey

14. A Game-Theoretical Approach for Lane-Changing Maneuvers on Freeway Merging Segments(https://ieeexplore.ieee.org/document/9294458), 2020
Keywords: when cars with CACC encounter lane-merging, which cars should accelerate and which should deceleration.
Summary:
This paper proposes a game-theoretical approach to analyze the on-ramp merging problem. Since the author thinks that the major drawback of ideas from papers in recent years is the extensive computational time, this paper proposes a non-cooperative and two-player game and its payoff function is simple. The players are the merging vehicle(P1) and the lag vehicle(P2) and their strategies are 'merge or not merge' and 'decelerate or accelerate' respectively. Algorithm 1 and Algorithm 2 are the payoff functions for P1 and P2 respectively and are based on the relation of the position and velocity between P1 and P2 and the lead vehicle. An experiment is conducted with CACC and the speed harmonization and the approach above and it shows that both CACC and the speed harmonization are essential to the approach.

15. Modeling Mandatory Lane Changing Using Bayes Classifier and Decision Trees (https://ieeexplore.ieee.org/document/6648406), 2014
Keywords: compare the costs of merging and not merging.
Summary: This paper presents a model that predicts whether the driver is going to merge or not. Not related to my survey.

16. Modeling Vehicle Merging Position Selection Behaviors Based on a Finite Mixture of Linear Regression Models(https://ieeexplore.ieee.org/document/8887159), 2019
Keywords: determine the merge point.
Summary:
This paper proposes a 3-class linear regression model to predict the desired merging position. Besides the model, the authors show the whole process including their thoughts, experiments and revisions. The authors think that due to the driver heterogeneity, it is not sufficient to make a model with only one class, just like most of other papers do. The authors also think that some factors actually affect merging decisions less and some actually affect more. Through experiment, they find that three classes is the optimal number according to the BIC (Bayesian information criterion). They also find that vehicle types, traffic density, and surrounding lane changing events affect merging decisions a lot, while some related positions and speeds are not as important as expected.

17. Vehicle Platooning Control for Merge Coordination: A Hybrid ACC-DMPC Approach

(https://ieeexplore.ieee.org/document/9922330), 2022
Keywords: make the gap bigger by accelerating the cars ahead for lane-merging.
Summary:
This paper proposes a vehicle platooning control with a hybrid ACC-DMPC controller to extend the merging gap. Adaptive cruise control (ACC) ensures safe interactions between vehicles. Distributed Model Predictive Control (DMPC) consists of many MPCs and an MPC can predict how a vehicle will move. We assume that there are n cars denoted as V1~Vn and V1 is the closest car to the lead car. First, the ACC controller generates a reference time headway for V1 while V2 to Vn also follow the same controller. Then, based on the information by the ACC controller and the target time headway of V2 , the MPC_1 controller can predict the V1 movement and generate a time headway for V2 while V3 to Vn also follow the same controller(MPC_1). Similarly, MPC_2 generates a time headway for V3 based on MPC_1 and so on. Note that each vehicle have its own target time headway based on its functional performance. By this method, the fact that the controller and the time headway keep changing results in a smaller speed variance and a naturalistic forward-moving shockwave, which is efficient and safe for the traffic flow.

18. Design of automated merging control by minimizing decision entropy of drivers on main lane(https://ieeexplore.ieee.org/document/7995790), 2017
Keywords: optimize the approaching speed for the merging car. decide whether to accept or reject the cut-in of the merging car. decision entropy
Summary:
This paper presents a method for the on-ramp merging problem. First, it presents a model that estimates the merging decision of the merging car and the acceleration of the cars on the main lane. Then, it uses the estimation to make a formulation to find the optimal acceleration of the merging car while minimizing the decision entropy. The model consists of two models, the acceptance model and the motion model. The acceptance model is used for estimating whether the car is going to merge or not and it is based on the logistic regression model and uses the data collected from the real world. The data is about “whether the driver merges or not under different circumstances like distance, velocity, etc”. The motion model is used for estimating the acceleration of the cars on the main lane corresponding to different merging decisions and it is based on switched PD acceleration control law. The formulation is for the control strategy called the model predictive control (MPC). However, an MPC problem is hard to be solved in real-time so it uses a randomized model predictive control (RMPC) approach.

19. Decentralized Optimal Control of Connected and Automated Vehicles at Merge Areas (https://ieeexplore.ieee.org/document/9549680), 2021
Keywords: determine the order and speed and time of merging in the on-ramp and off-ramp scenario.
Summary:
This paper presents two sets of formulations for scenarios having on-ramps and off-ramps. The first set of formulations helps find each cars’ optimal speeds, accelerations of each time slice and the optimal time starting to merge, which we can determine the passing order. These formulations consider collisions and the road density. If the traffic on the lane is too heavy, the road density lets the cars on the lane have the priority to pass the merging area

so that the cars on the lane can exit faster. The second set of formulations are about the trajectory of merging, which is not related to my survey.

—----------------------------------------
update: 2023/5/10

20. Research on Traffic Behavior in the Presence of Lane Merging Using Traffic Simulation(https://ieeexplore.ieee.org/document/10101384), 2022
Keywords: have an experiment for 2-to-1 scenario(no changing lanes) with different priority rules, road type, types of vehicles, etc.

21. Cooperative Lane Changing Strategies to Improve Traffic Operation and Safety Nearby Freeway Off-Ramps in a Connected and Automated Vehicles Environment(https://ieeexplore.ieee.org/document/8855110), 2020
Keyword: lane-changing strategy before a off-ramp area

22. Cooperative Decision Making of Connected Automated Vehicles at Multi-Lane Merging Zone: A Coalitional Game Approach(https://ieeexplore.ieee.org/document/9394812), 2022
Keyword: Coalitional Game Approach,

23. A Dynamic Adaptive Algorithm for Merging Into Platoons in Connected Automated Environments(https://ieeexplore.ieee.org/document/8845748), 2020
Keyword: on-ramp,

24. A Hierarchical Model-Based Optimization Control Approach for Cooperative Merging by Connected Automated Vehicles(https://ieeexplore.ieee.org/document/9145866), 2021
Keyword: on-ramp,

25. Autonomous Vehicle Cut-In Algorithm for Lane-Merging Scenarios via Policy-Based Reinforcement Learning Nested Within Finite-State Machine(https://ieeexplore.ieee.org/document/9729796), 2022
Keyword: reinforcement learning