

FTA analysis for planning module

Definition of planning module(temp)

For the planning module, define nodes with "planning" as the namespace prefix at the beginning of their names.

Node Name
/planning/mission_planning/mission_planner
/planning/mission_planning/mission_planner_container
/planning/mission_planning/route_selector
/planning/planning_evaluator
/planning/planning_validator
/planning/scenario_planning/external_velocity_limit_selector
/planning/scenario_planning/lane_driving/behavior_planning/behavior_path_planner
/planning/scenario_planning/lane_driving/behavior_planning/behavior_planning_container
/planning/scenario_planning/lane_driving/behavior_planning/behavior_velocity_planner
/planning/scenario_planning/lane_driving/motion_planning/elastic_band_smoother
/planning/scenario_planning/lane_driving/motion_planning/motion_planning_container
/planning/scenario_planning/lane_driving/motion_planning/motion_velocity_planner
/planning/scenario_planning/lane_driving/motion_planning/obstacle_cruise_planner
/planning/scenario_planning/lane_driving/motion_planning/path_optimizer
/planning/scenario_planning/lane_driving/motion_planning/surround_obstacle_checker
/planning/scenario_planning/parking/costmap_generator
/planning/scenario_planning/parking/freespace_planner
/planning/scenario_planning/parking/parking_container
/planning/scenario_planning/scenario_selector
/planning/scenario_planning/velocity_smoother
/planning/scenario_planning/velocity_smoother_container

Input and output of planning module

Inputs will be topics that the planning module subscribes to from external modules.

Outputs will be topics that are published to the control module.

Summarizing based on [pilot-auto](#) as of July 4, 2024

Input

topic name	meaning	from	to (omitted if there are many)
/planning/scenario_planning/max_velocity_default	maximum velocity of the ego vehicle	api	external_velocity_limit_selector behavior_velocity_planner
/system/operation_mode/state	operation mode about operation mode and topic	system	behavior_path_planner velocity_smoother

topic name	meaning	from	to (omitted if there are many)
	type		
/map/vector_map	lanelet information	map	-
/localization/kinematic_state	ego position	localization	-
/localization/acceleration	ego acceleration	localization	-
/tf	information for coordinate translation	localization	-
/tf_static	broadcast viewer frames	localization	-
/perception/object_recognition/objects	dynamic objects	perception	-
/perception/occupancy_grid_map/map	occupancy grid map	perception	-
/perception/obstacle_segmentation/pointcloud	point cloud of obstacles which the ego-vehicle should stop or avoid	perception	-
/perception/traffic_light_recognition/traffic_signals	traffic light information	perception	-

For those inputs to the planning module where the subscribed nodes are essentially non-functional, categorize them in following table

topic name	meaning	from	
/perception/virtual_traffic_light_states	virtual traffic light states	perception	moti
/awapi/tmp/virtual_traffic_light_states	virtual traffic light states	api	beha
/planning/scenario_planning/lane_driving/behavior_planning/behavior_path_planner/input/lateral_offset	side shift request from operator	hmi	beha

Output

topic name	meaning	from	to (omitted if there are many)
/planning/hazard_lights_cmd	hazard light	behavior_path_planner	vehicle_cmd_gate
/planning/turn_indicators_cmd	turn indicator	behavior_path_planner	vehicle_cmd_gate
/planning/mission_planning/route	route	mission_planning	lane_departure_checker_node
/planning/scenario_planning/trajectory	trajectory to be followed	planning	-

Feature diagram

While some minor changes are necessary to align with the current implementation, the functional structure conforms to the current state.

