Software Architecture

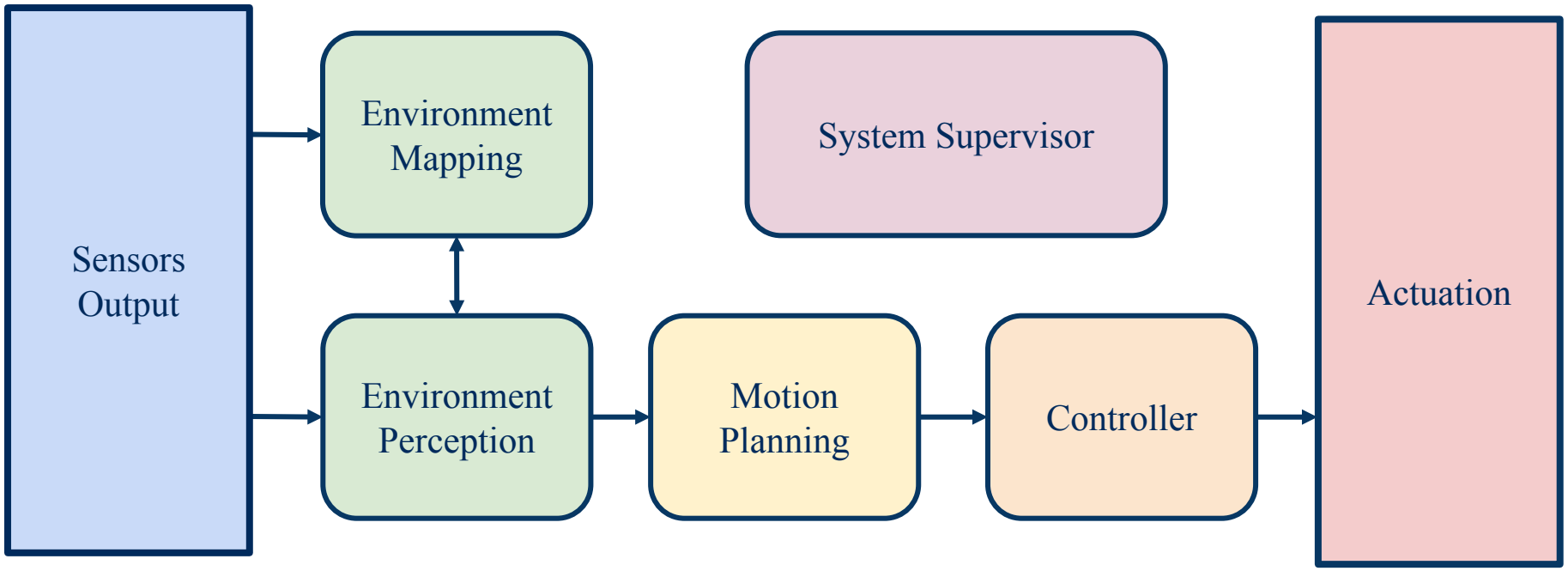
Course 1, Module 2, Lesson 3

UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

Learning Objectives

- Describe the basic architecture of a typical self-driving software system
- Identify the standard software decomposition
  - Environment Perception
  - Environment Mapping
  - Motion Planning
  - Controller
  - System Supervisor

Software Architecture | High-level



Software Architecture | Environment Perception

Inputs

GPS / IMU / Wheel Odometry

LIDAR Cameras Radar

HD Road Map

Localization

Dynamic Object Detection

Static Object Detection

Bounding Boxes

Dynamic Object Tracking

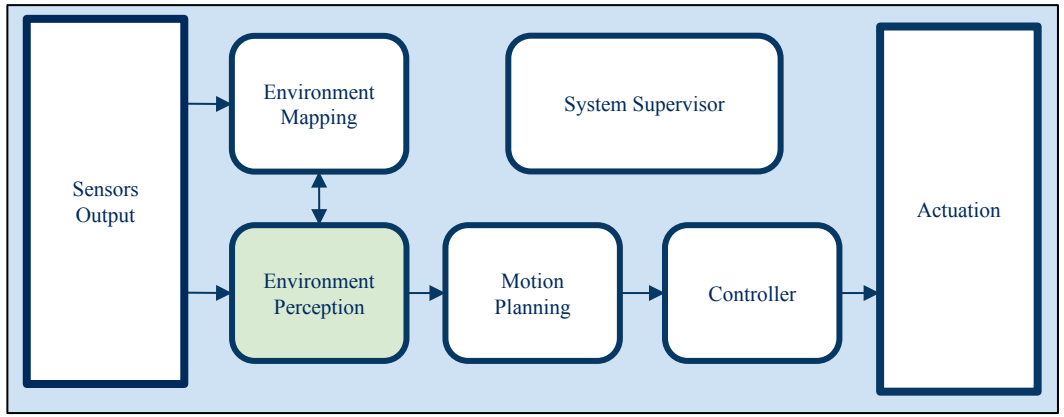
Object Tracks

Object Motion Prediction

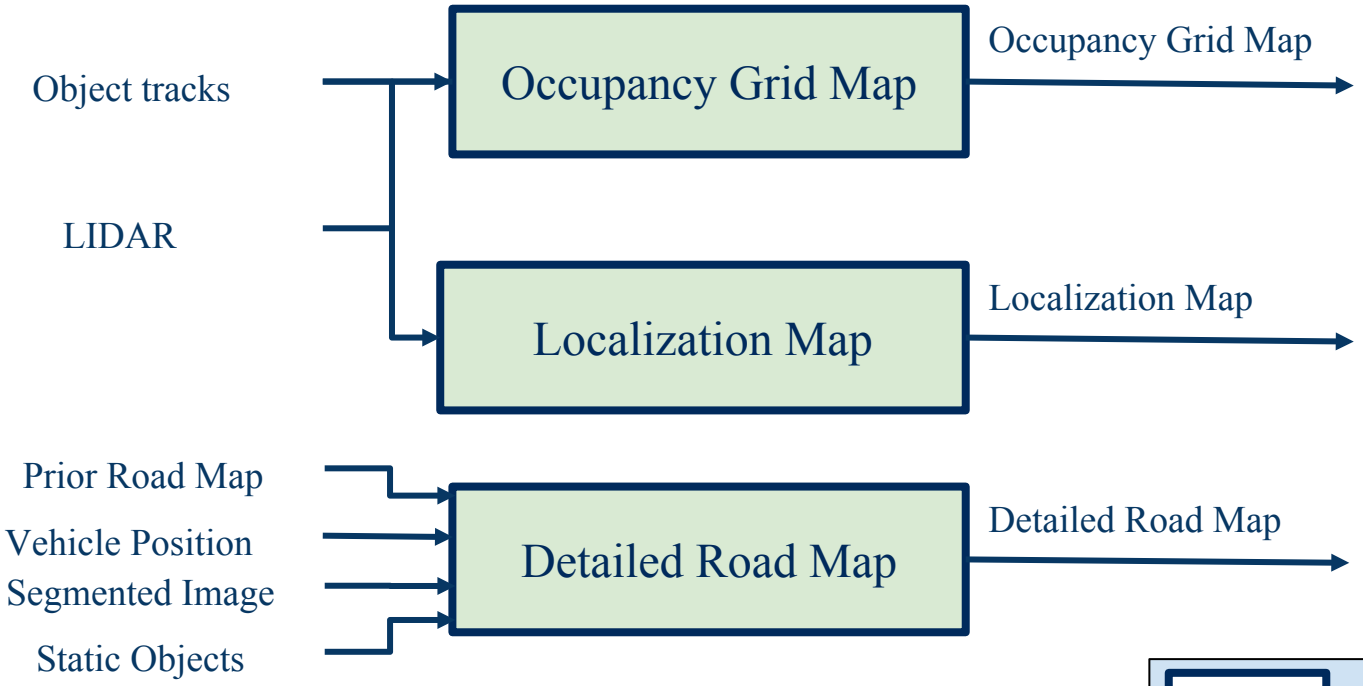
Vehicle Position

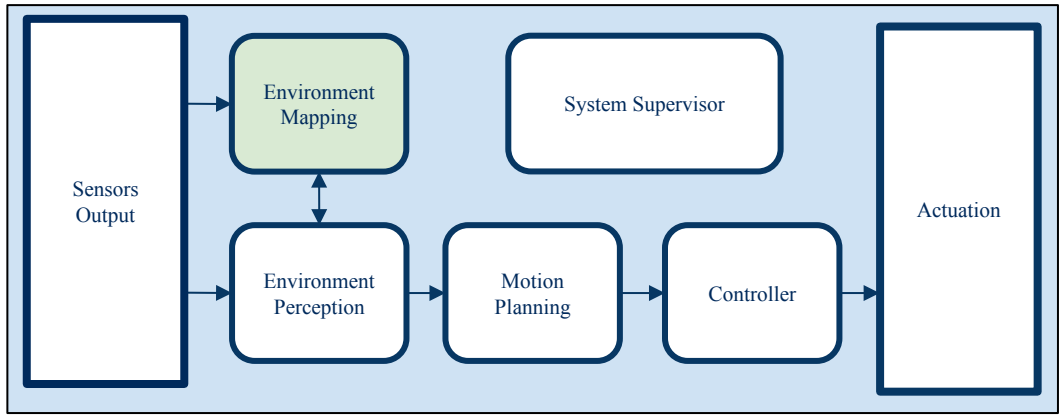
Dynamic Objects

Static Objects

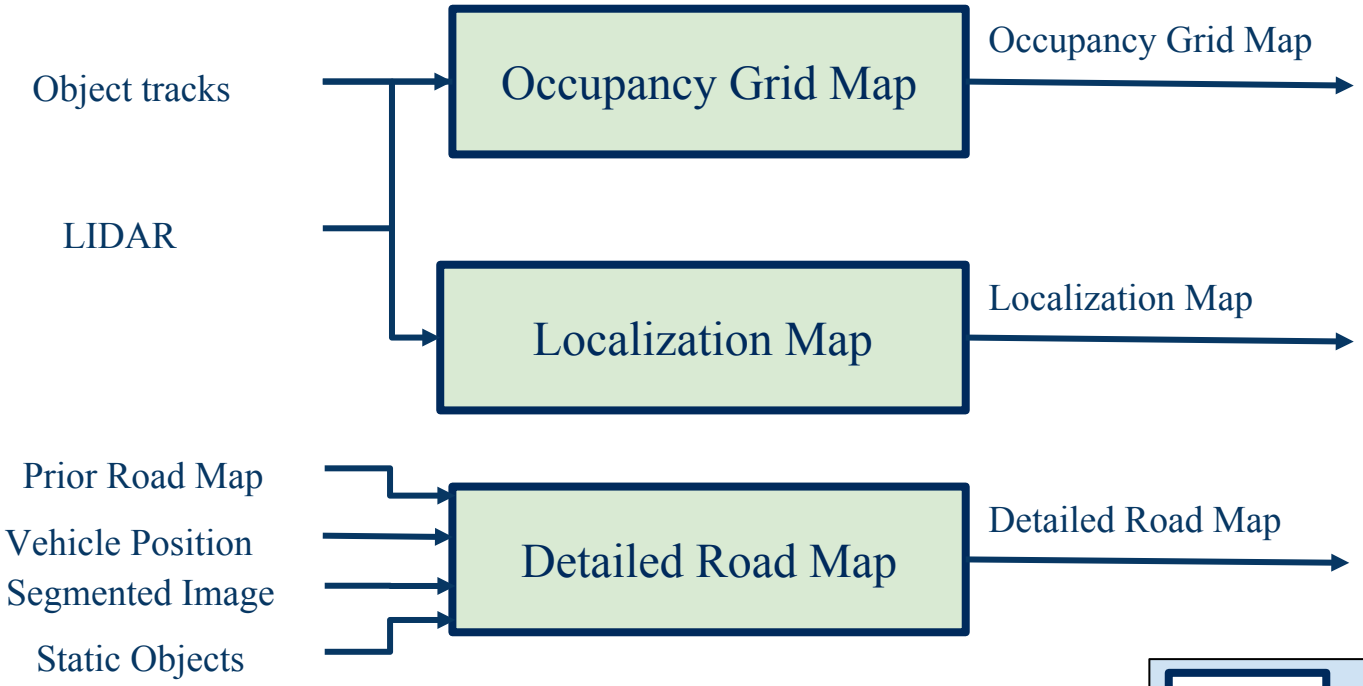


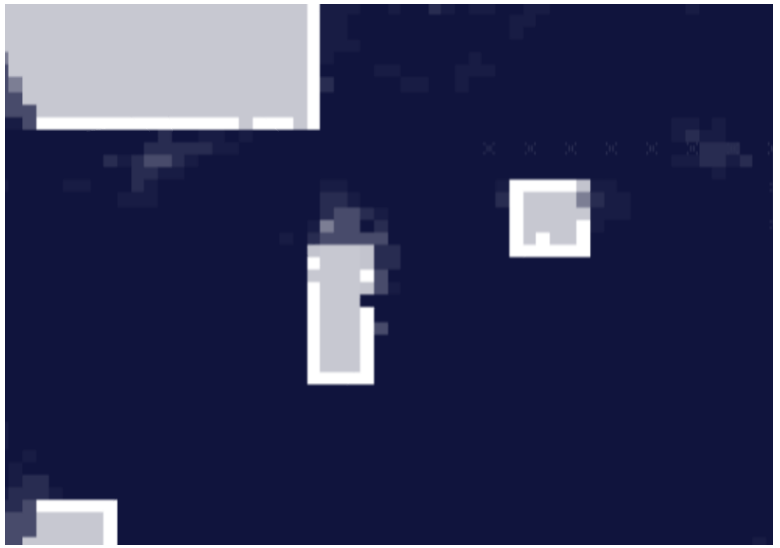
Software Architecture | Environmental Maps

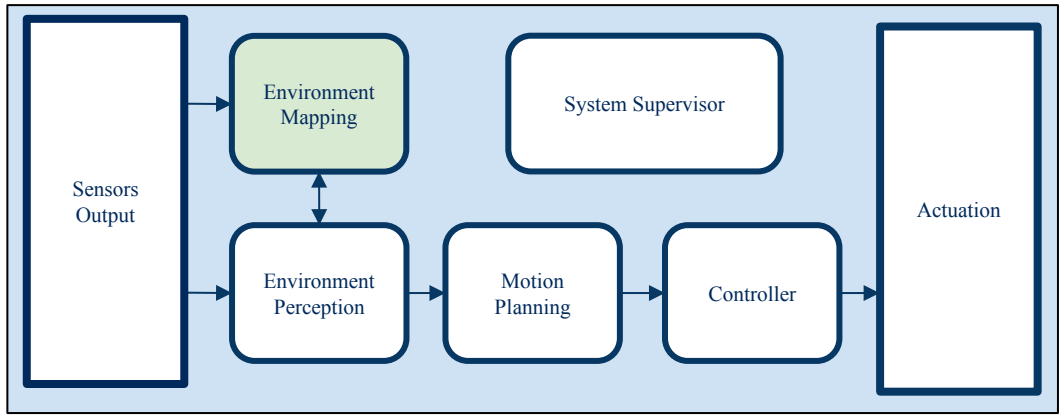




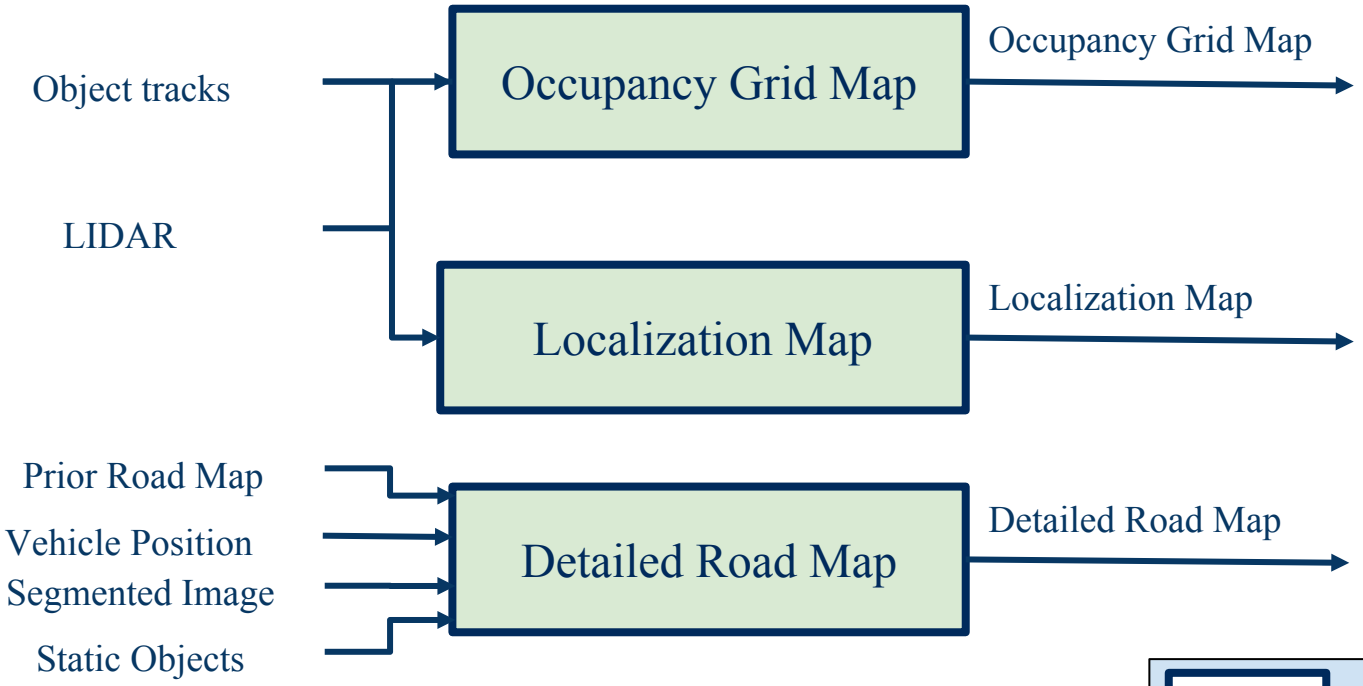
Software Architecture | Environmental Maps

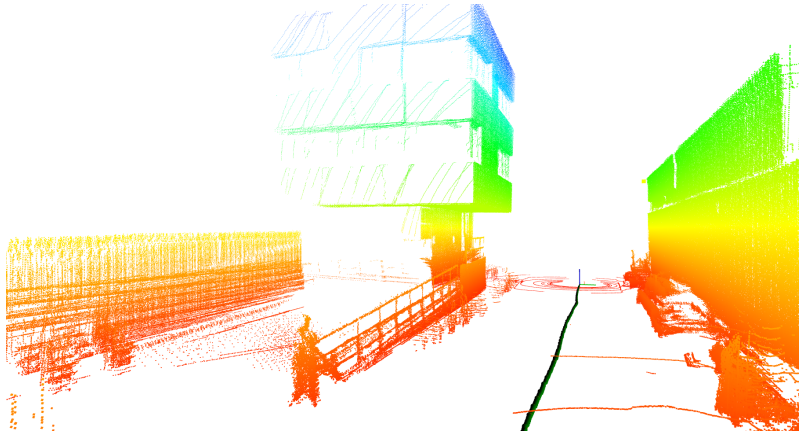


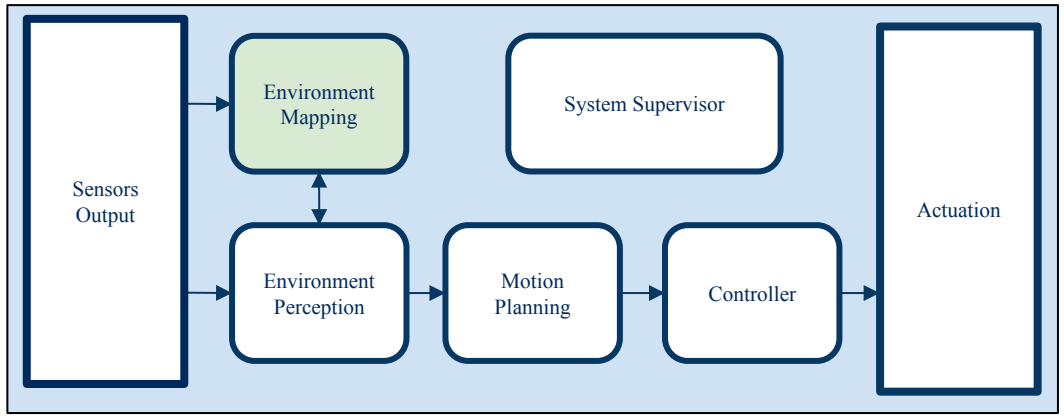




Software Architecture | Environmental Maps







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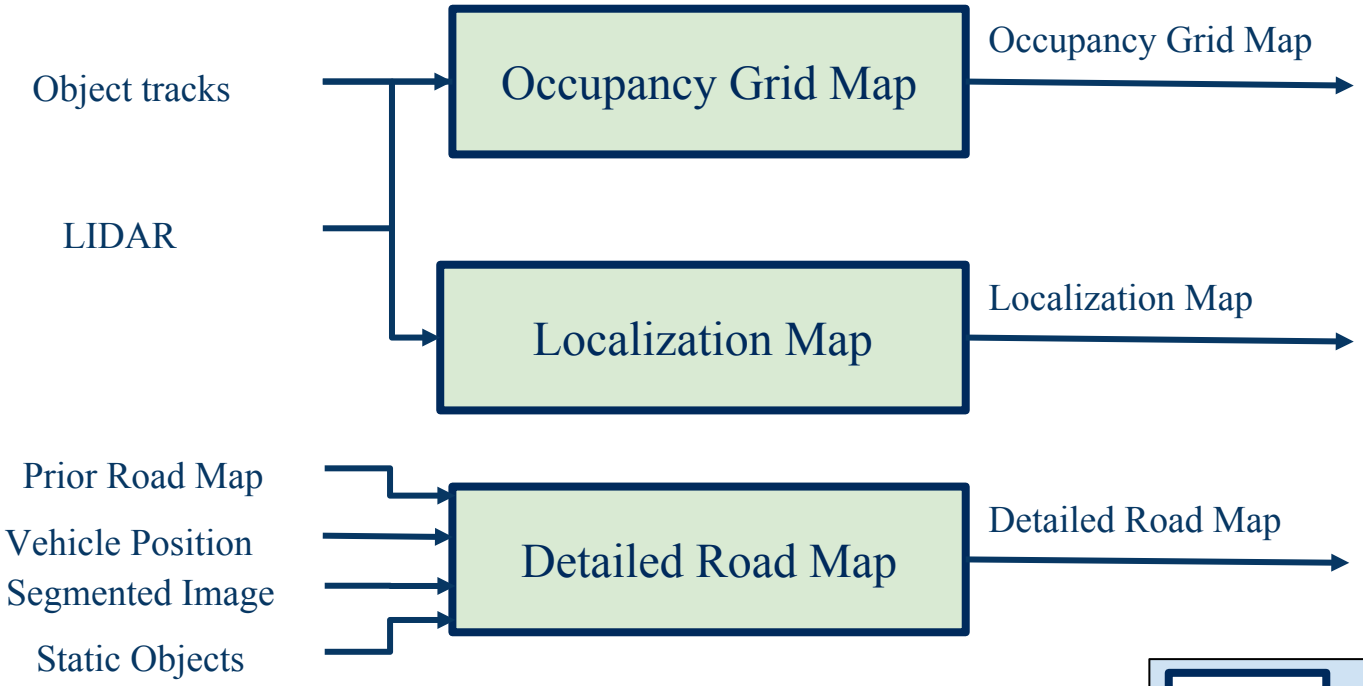
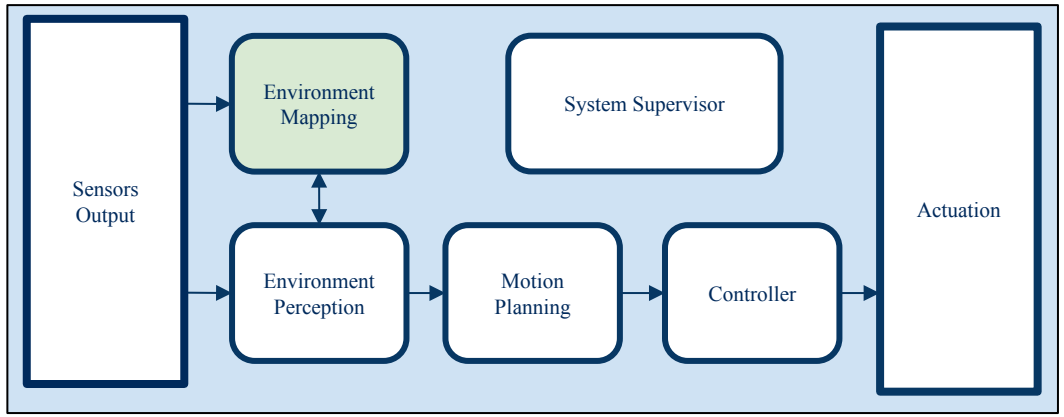
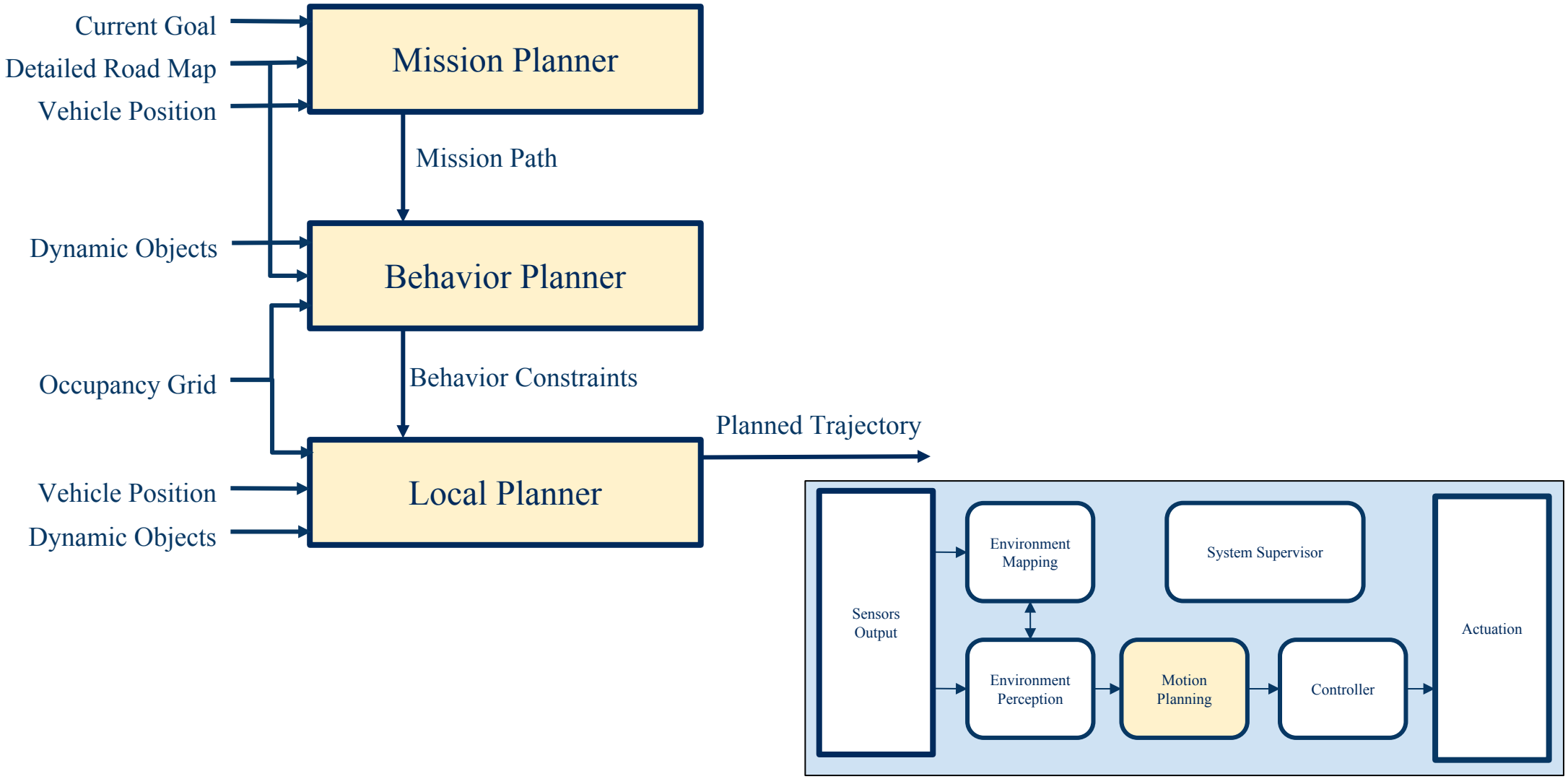




Software Architecture | Motion Planning



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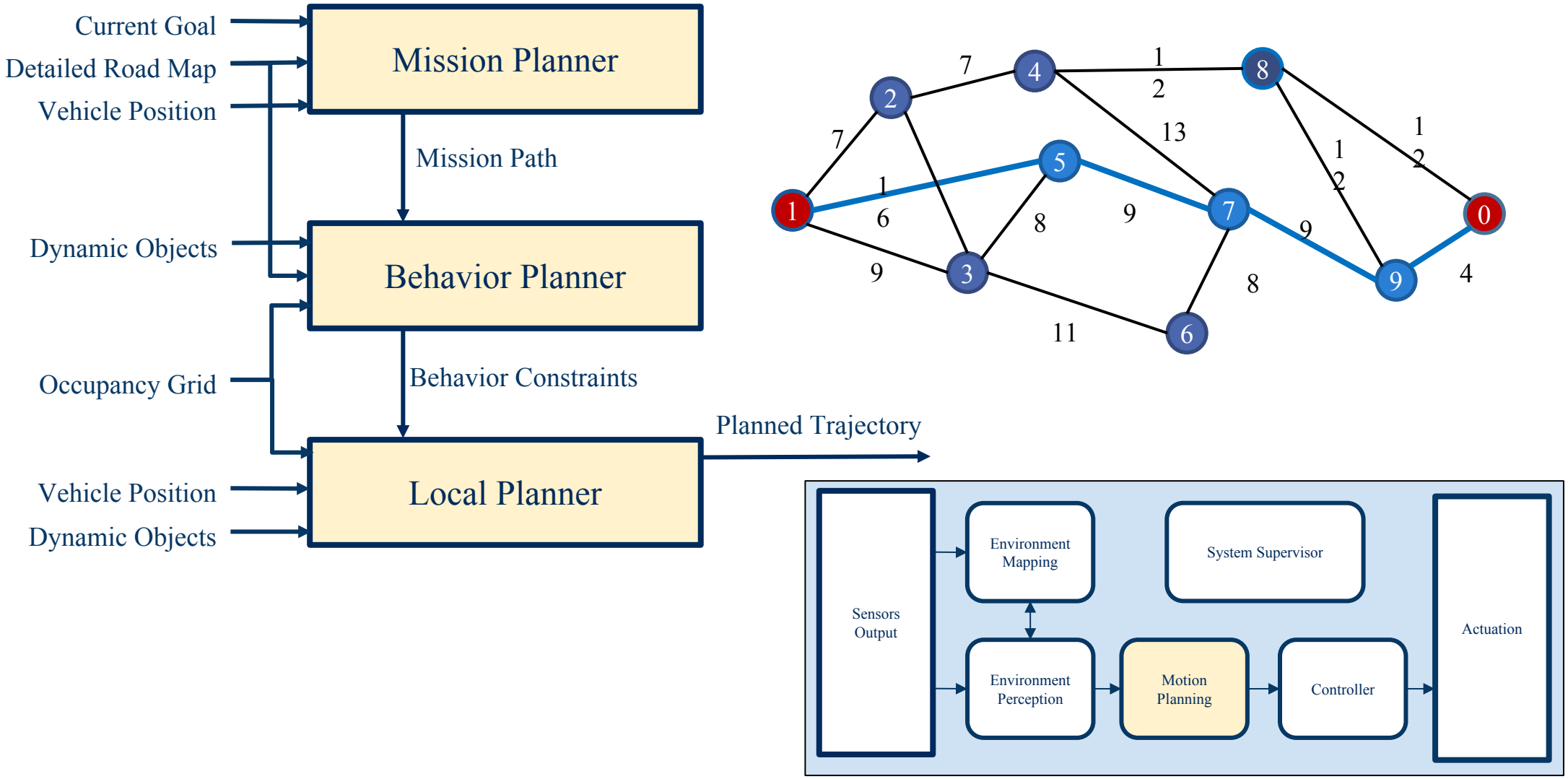
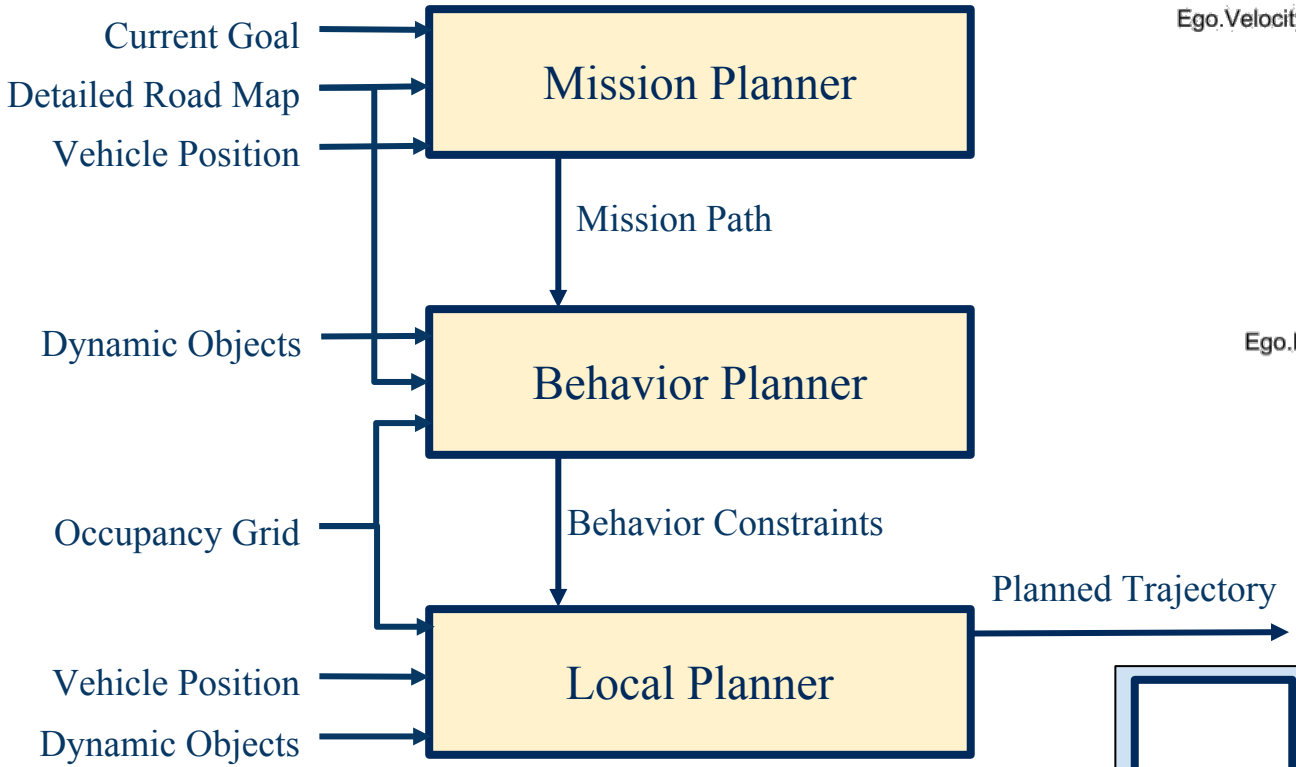
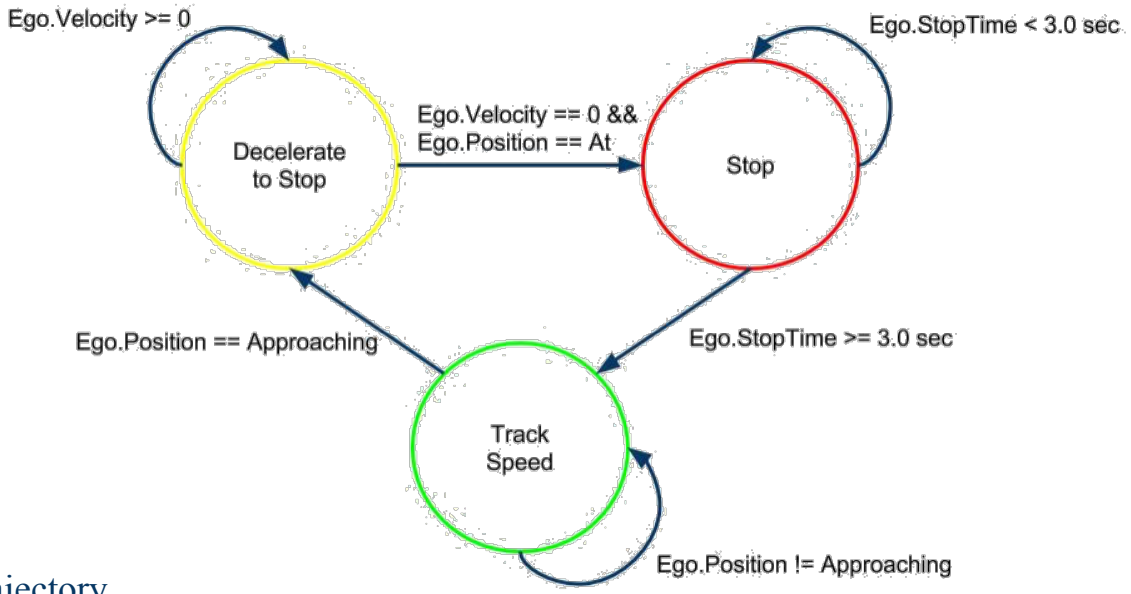
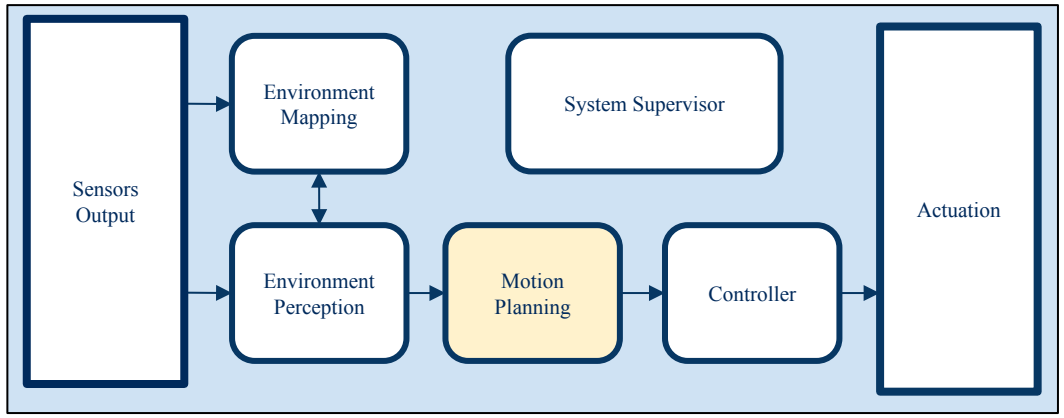


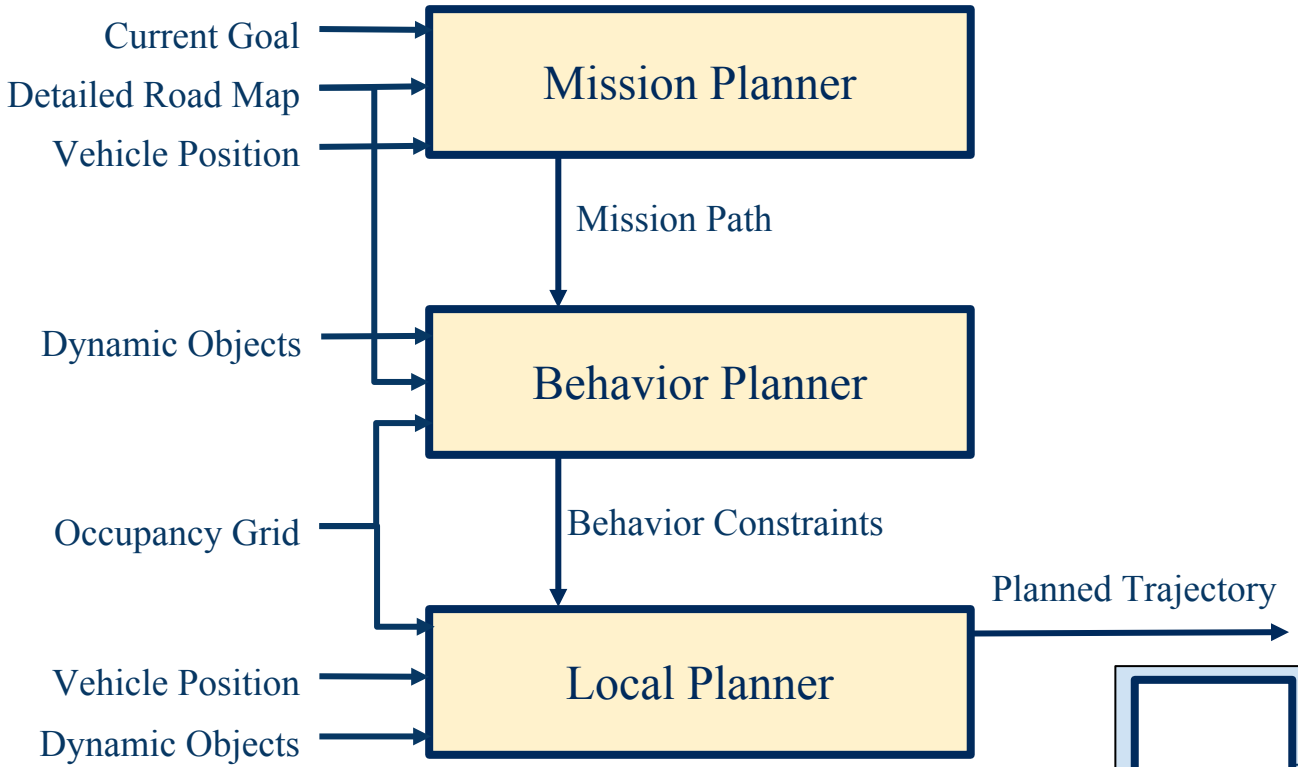
Software Architecture | Motion Planning

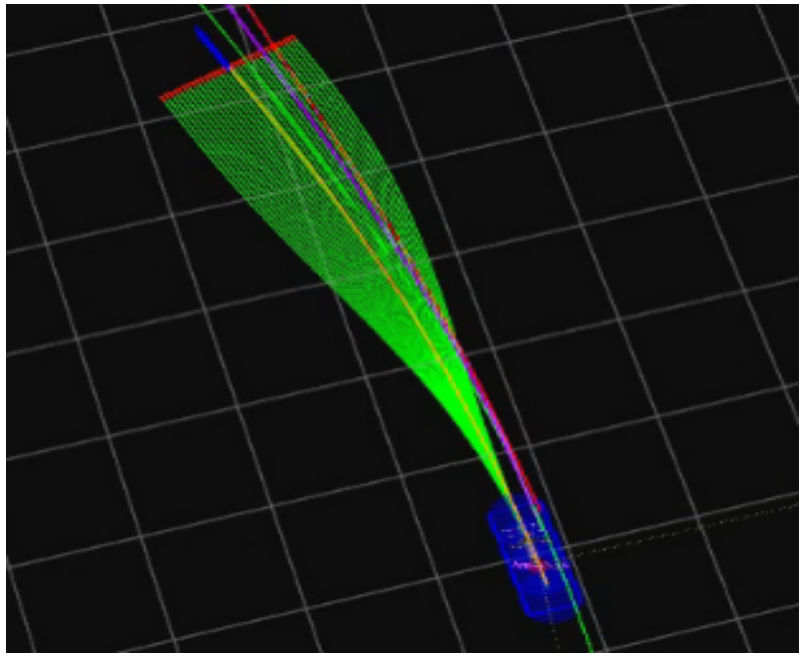


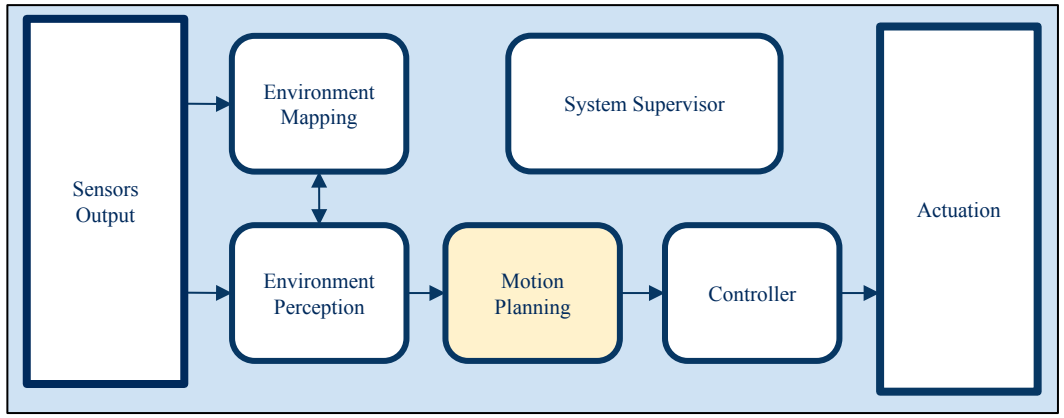




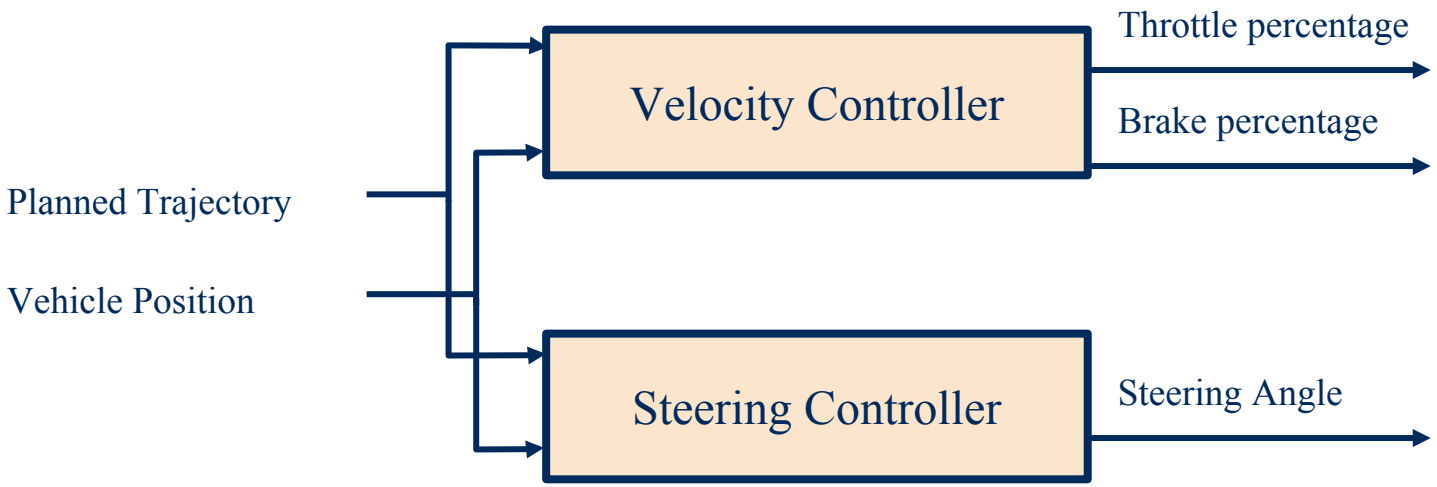
Software Architecture | Motion Planning

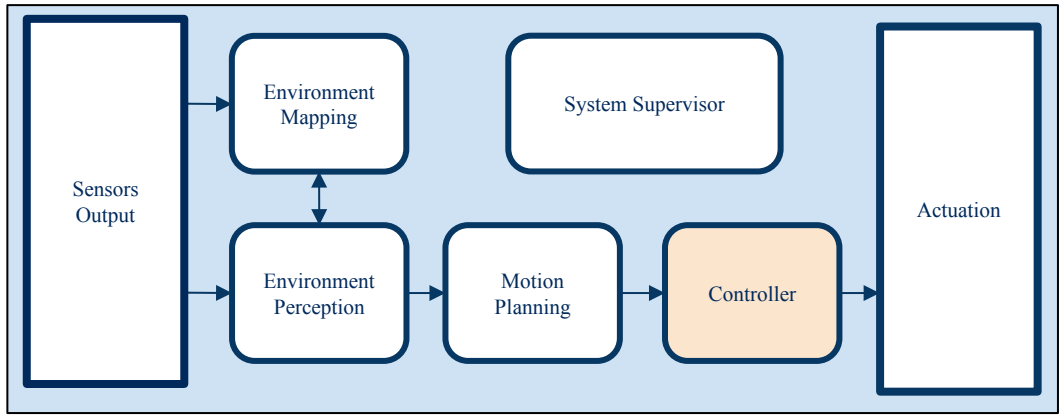




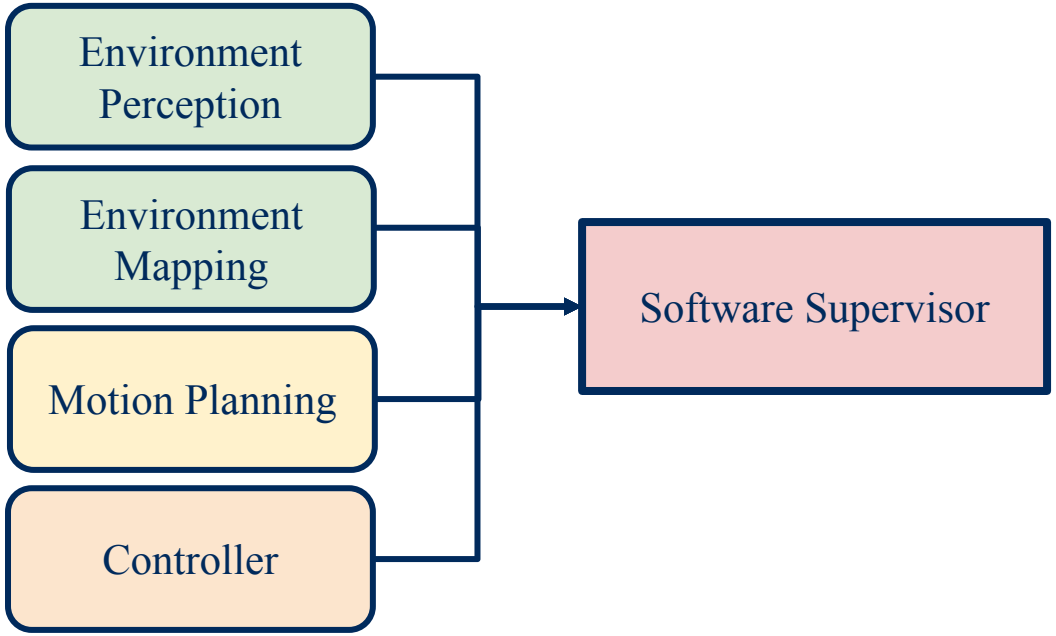


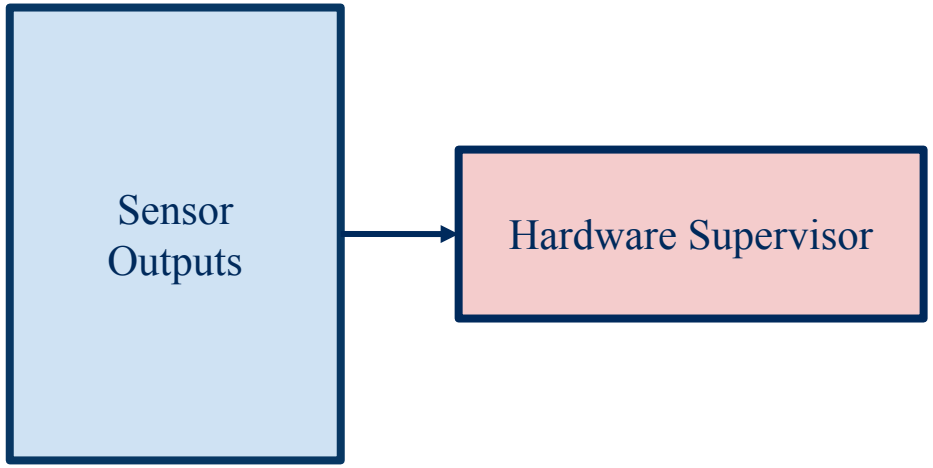
Software Architecture | Vehicle Controller

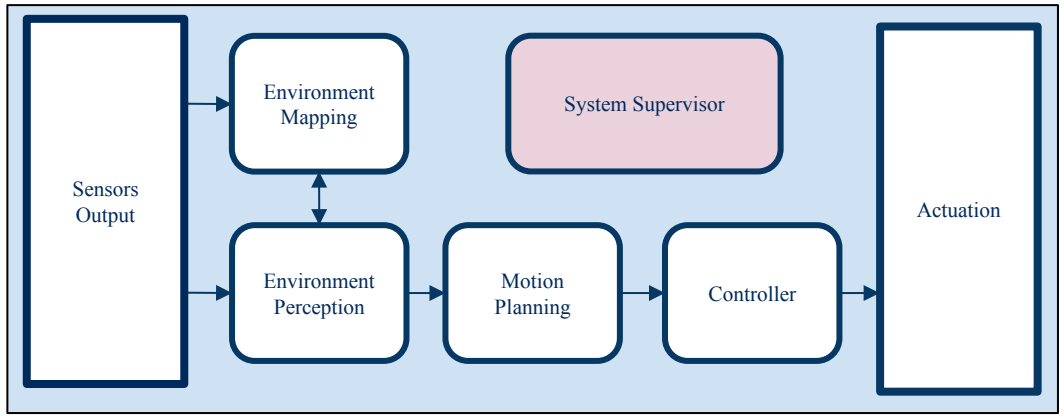




Software Architecture | System Supervisor







Summary

- Describe the basic architecture of a self-driving software system
  - Environment Perception
  - Environment Mapping
  - Motion Planning
  - Controller
  - System Supervisor
- Next: Closer look at Environment Mapping