

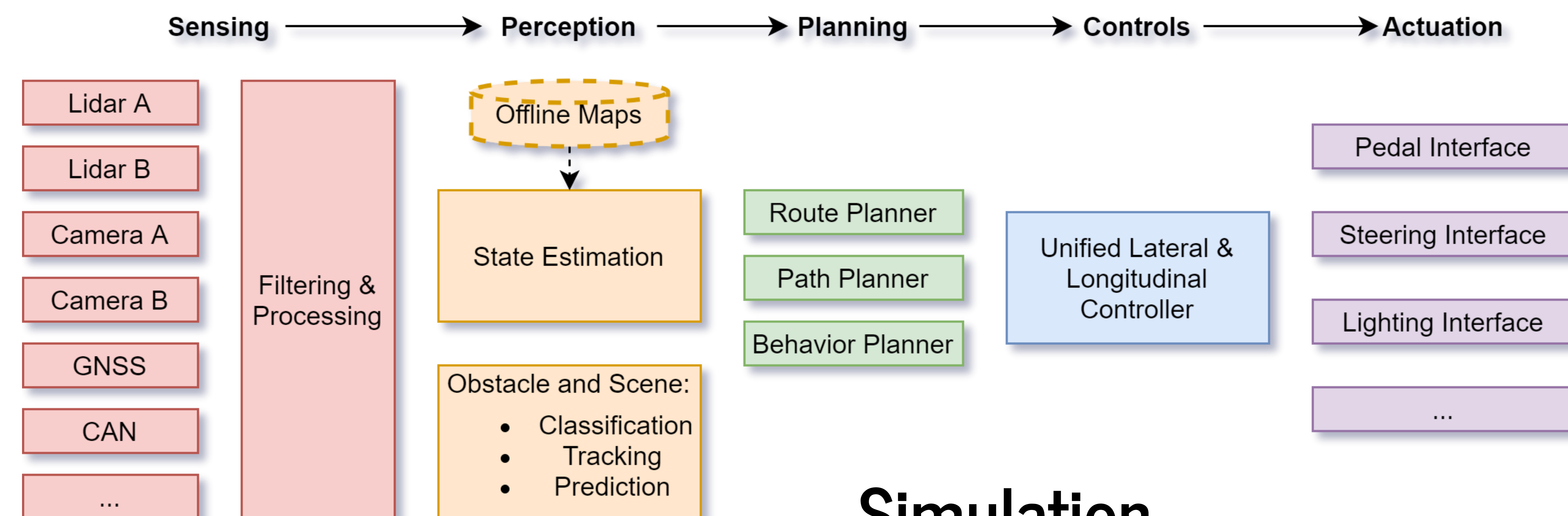
Motivation

1. Researchers lack a simple, fully-featured, and open-source self-driving platform.
2. DFW needs a community-driven self-driving solution.

Perception

The perception part of the system takes the data from:

- Lidar
 - Stereo camera
 - IMU, GPS, Odometry
- And uses it for tasks like:
- Localization and state estimation.
 - Obstacle and scene classification
 - Obstacle tracking and prediction



Planning

Our behavior planner makes high-level decisions like:

- Map-level navigation
- Creation of no-entry or low-speed zones based on perception and map
- Calculation of desired vehicle trajectory using zones
- Transition between behavior modes based on vehicle state

Simulation

- We test repetitive or dangerous scenarios in a highly realistic simulator
- New code is tested in the real world only when it's tested exhaustively in simulation

Hardware

- Our base is a Polaris GEM e6
- Front + rear LiDAR
- Front + rear stereo cameras
- Electronic steering and pedals
- Embedded computer

Control

- Uses IMU, GPS, and vehicle odometry
- Calculates accelerator pedal, brake pedal, and steering wheel positions to keep the vehicle on its trajectory

This year's goals

1. Develop a shuttle that operates in a 2-mile loop of UT Dallas's campus
2. Submit our agent to the CARLA Autonomous Driving Challenge
3. Build relationships with other researchers in the autonomous driving field



Support our mission

Sponsorship allows us to purchase new sensors, conduct outreach activities, and more. If you are interested in sponsoring our efforts, contact jruths@utdallas.edu.

Videos, updates, and more: nova-utd.github.io

