Setting up MKZ Sensor Kit, Vehicle Model, and Launch files

Approximate Time Investment: 3 hours

With Autoware installed and the simulation using the sample vehicle model and sensor kit working, we will install the following for our Autonomous MKZ Research Vehicle:

- Vehicle Model
- MKZ specific Autoware launch xml file
- MKZ specific sensor driver xml file
- Some debugged scripts
- Autoware <-> MKZ (Dataspeed) Interface

The files will be provided in order to accelerate the start of working with the vehicle, but it is advised to understand the background and fundamentals of these files, especially for futher research and development with the vehicle.

Requirements (these drivers need to be installed and built specifically in home/ros2_ws):

- Ouster OS2 ROS2 Drivers (Covered in Hello World I and II)
- opencv_cam ROS2 Drivers
- SWRI's Novatel PP6 ROS2 Drivers

Resources:

- Creating a Sensor Model
- Creating a Vehicle Model
- Vehicle Interface Overview
- Creating a Vehicle Interface
- Official ROS2 URDF Robot Model Guide

Downloads:

- MKZ Autoware Import

Importing Pre-Made Models, Launch Files, Sensor Kits, and Vehicle Interface

The MKZ Autoware Imports file above contains all of the mentioned models, launch files, sensor kits, and vehicle interface along with install instructions.

The files implement the Ouster OS2 lidar + IMU, one camera, and the Novatel PP6 GNSS/IMU unit.

It is as simple as dragging the packages into the right directory then finally building the Autoware workspace with the following command:

```
colcon build --symlink-install --cmake-args -DCMAKE_BUILD_TYPE=Release
```

Launching Autoware with our MKZ Model on the UNLV Map

Now that we have Autoware, MKZ vehicle model, MKZ sensor kit, and UNLV map, we will launch Autoware on the UNLV map with the following command:

```
ros2 launch autoware_launch run_mkz.launch.xml vehicle_model:=mkz sensor_model:=mkz_sensor_kit
map_path:=$HOME/autoware_map/mkz_map/
```

The result should be the following: Autoware - MKZ Launching on UNLV Map