**Problem Formulation**

During research, many of the problems in research papers the past few years have been attributed to sparse point clouds in LiDAR when handling 3D object detection. Additionally, interaction between 3D sparse points and dense 2D pixels have not been explored well. Another main point is that most research papers only explore sensor fusion between two sensors, rather than 3.

**Thesis Objectives**

The objective will be to explore sensor fusion between LiDARs, RADARs and cameras. Since papers exploring all 3 simultaneously are rare, this will add to the knowledge base. Finding the right Deep Learning Model is essential, as one will be used for Sensor Fusion and one will be used for 3D Object Detection. It is also important to have a deep understanding of each sensor and how they work. Choosing which fusion strategy (early, intermediate or late) will also have a huge impact. Additionally, optimizing the model and using existing datasets such as nuScenes or KITTI will help demonstrate the effectiveness of the new proposed model.

**Thesis Contribution**

Combining all 3 sensor types (LiDAR, RADAR and Cameras) is relatively uncommon. This thesis will propose a new model that can be compared to benchmarks, which will help improve 3D Object detection and enhance sensor feature alignment. Additionally, optimization of the model will help better the accuracy and performance of the sensors when combined.