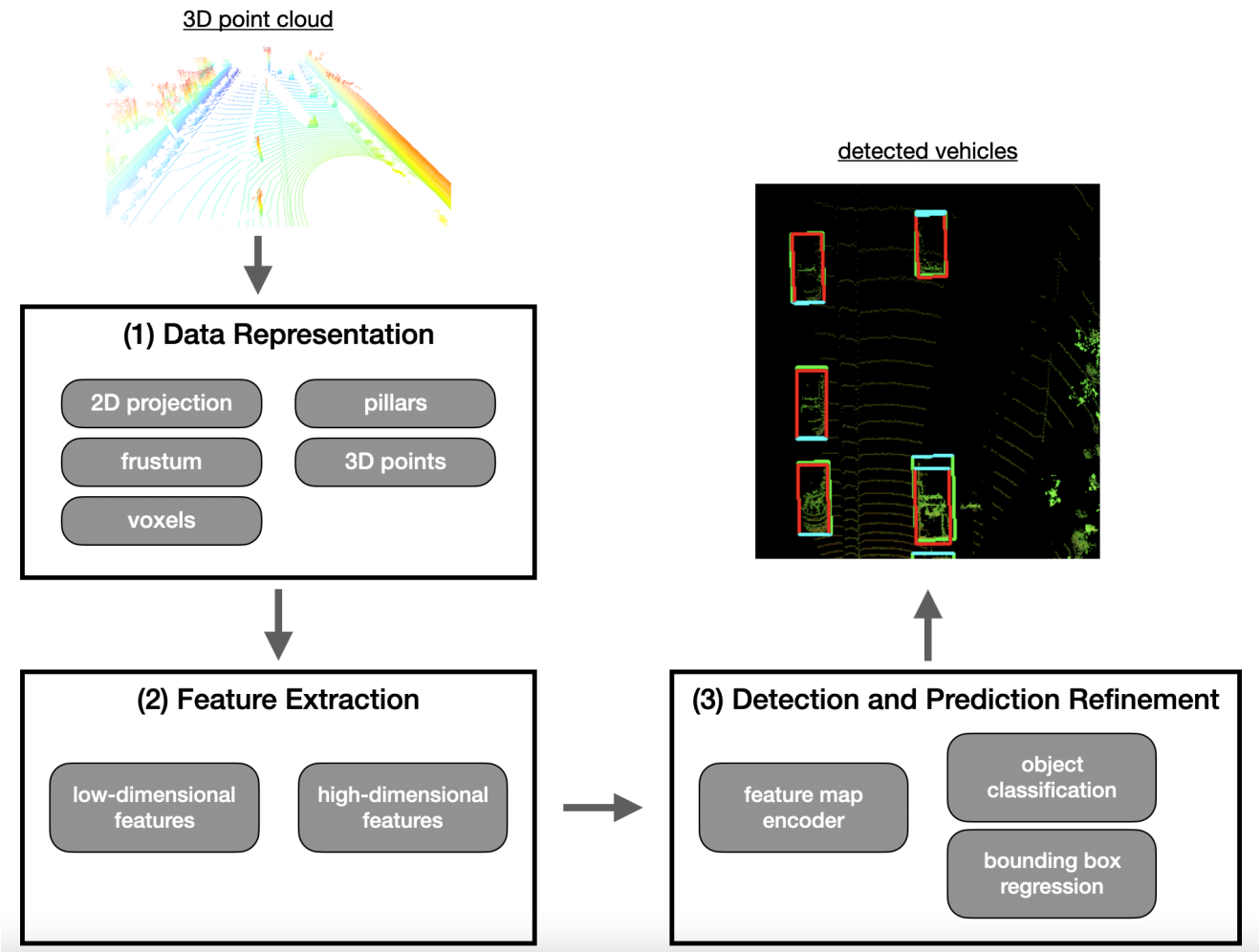
State-of-the-Art in 3D Object Detection

In this chapter, we will have a look at a processing pipeline for object detection and classification based on point-clouds. The pipeline structure consists of three major parts, which are (1) data representation, (2) feature extraction and (3) model-based detection. The following figure shows the data flow through the pipeline with raw point cloud on one end and the classified objects on the other end:



Typical object detection pipeline

In the first part, the point cloud provided by the lidar sensor is organized into a structure that is suited for an efficient processing of the data in the subsequent pipeline stages. In the existing research, two major approaches for data representation exist: Either the point cloud is transformed into a structure such as "voxels", "pillars" or