

Lane detection plays a critical role in autonomous vehicle navigation. While traditional approaches utilize camera data, they often suffer from significant image distortion issues. In contrast, recent developments have introduced techniques based on LIDAR (Light Detection and Ranging) data, which are unaffected by these limitations. The primary goal of this study is to investigate and develop LIDAR-based lane detection techniques, with a particular focus on machine learning algorithms. It will propose a novel approach and compare different variations of this approach to evaluate their performance and potential advantages. Through this comparative analysis, the study seeks to contribute to the development of autonomous vehicle navigation by offering a more robust and accurate lane detection solution that can significantly reduce navigation errors and improve overall vehicle safety.