Sensor Fusion in Autonomous Vehicle Decision-Making

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Abstract:
The core component of Advanced Driver Assistance Systems (ADAS) is the perception module, which has been a primary focus for enhancing robustness and quality against various environmental conditions like changing lighting and weather. Recent studies have highlighted sensor fusion, particularly between cameras and LiDAR. This research delves into a less explored domain, focusing on early fusion between camera modules and LiDAR sensors. Employing a deep learning architecture, we aim to integrate minimally processed radar signals and corresponding camera frames to mitigate inaccuracies in the perception module. Our evaluation, conducted using real- world data, demonstrates that combining radar and camera signals can reduce model errors by up to 15% in tasks related to object detection.

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