The world around us is rapidly changing and new technology presents us with the opportunity to make travelling a much safer experience. With the development and commercialization of automated driving system (ADS)-equipped vehicles (AVs), a question arises: “What level of operational safety performance is required compared to that of a human-driven vehicle (HDV)?” Operational safety of AVs is a key requirement before public road deployment can occur and thus, a methodology to quantitatively compare AVs and HDVs is needed.

This project seeks to provide data from the CARLA simulator using various traffic scenarios and vehicle controllers to refine the safety metrics that comprise the comparison methodology.

**What is CARLA?**
CARLA is an open-source simulator for AV research. It provides digital assets and a platform geared towards flexible specification to allow for the creation of valuable data.

**Problem Statement**
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**Background**
What is CARLA?
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**Motivation**
The world around us is rapidly changing and new technology presents us with the opportunity to make travelling a much safer experience. With the development and commercialization of automated driving system (ADS)-equipped vehicles (AVs), a question arises: “What level of operational safety performance is required compared to that of a human-driven vehicle (HDV)?” Operational safety of AVs is a key requirement before public road deployment can occur and thus, a methodology to quantitatively compare AVs and HDVs is needed.

**Future Research**
Further Scenario Development:
Currently 4 out of 37 NHTSA pre-crash scenarios are modeled in CARLA. Additionally, a scenario database needs to be developed that includes challenging scenarios, known as “edge cases”.

**Vehicle Controllers:**
New vehicle controllers developed to test and collect data on safety metrics.

**Conclusion**
In order for AVs to serve their purpose and make our roads safer, it must be ensured that they perform at standards that can be quantitatively measured. This research is a crucial step in understanding the effectiveness of AVs in comparison to HDVs, and will be an important component of a safety case-based assessment methodology that will include evidence to corroborate safety claims of AVs that are to be deployed on public roads. This work gives public and private sectors new tools to push the AV world forward.

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