

A Risky Coexistence: Examining the Challenges Faced by Autonomous Vehicles and Motorcycles

Research of the Enhancing Self-Driving Car Performance: The Potential Dangers of Autonomous Vehicles and Motorcycles

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Abstract

Introduction

Main Objectives

- Understanding of what dangers exist with AVs.
- Establishing the appropriate datasets to train and test the models.
- Pre-processing any datasets to improve the training progress.
- Evaluation of the test results to see specific information about where AVs may fail.

Materials and Methods

Materials and Methods — Training

With being faced with the challenge of setting up a high-end model equivalent to a leading AV manufacturer, similarly to Tesla, then it is very important to use quality Object Classification training material. Using the Qualitative Research method with the use of video frames and labels to classify the different objects found in the video is required. Using different sources found in various research journals, Roboflow and other materials are

Materials and Methods — Testing

Testing materials must include video content, split into multiple frames To test the trained YOLO model, with enough images to create a strong argument. Joining a motorcycle group and exploring various routes across the United Kingdom, including motorways, dual carriageways, A-roads, and backroads, with motorcycles overtaking, filtering, and navigating blindspots, can lead to unexplored scenarios and questions that may have been previously overlooked.

A decided factor is to use a Drift Innovation Ghost XL motorcycle camera attached to a motorcycle that rides within the group, then swap the camera with another rider after some time. This way, when combining the content helps with identifying how Object Classification copes with numerous blindspots and draw some questions to further the research concerning the current safety of AV vehicles.

Two sports bikes and two cruisers are selected for material to test how Object Classification models handle different motorcycle styles. Ideal footage would include Scramblers, Trikes and other similar

vehicles to establish how Object Classification models work in an estimated manner. A perfect material would be that during the ride out, conducted on 18th July 2023, Tuesday, would capture these vehicles, which either pass by or join us in sections of the rides. The group is instructed to overtake and be undertaken by the camera vehicle to create plenty of footage to put the YOLO model to the test. However, it is worth noting that no rider is pressured into doing anything illegal or unsafe.

Results

Conclusions

Forthcoming Research

References

- [1] Albert Bill and Tullis Tom. *Measuring the user experience: collecting, analyzing, and presenting usability metrics*. The Morgan Kaufmann series in interactive technologies. Morgan Kaufmann, Amsterdam :, 2008. Book Title: Measuring the user experience : collecting, analyzing, and presenting usability metrics.
- [2] Chisnell Dana and Rubin Jeffrey. *Handbook of usability testing how to plan, design, and conduct effective tests*. Wiley Pub, Indianapolis, IN, 2nd ed. edition, 2008.
- [3] Marwa Hentati, Lassaad Ben Ammar, Abdelwaheb Trabelsi, and Adel Mahfoudhi. A fuzzy-logic system for the user interface usability measurement. In *2016 17th IEEE/ACIS International Conference on Software Engineering, Artificial Intelligence, Networking and Parallel/Distributed Computing (SNPD)*, pages 133–138, May 2016.
- [4] Tina Kister. Improving the information development process: A refined iterative development model. 63:186–211, August 2016.
- [5] Jakob Nielsen and Jonathan Levy. Measuring usability: preference vs. performance. *Communications of the ACM*, 37(4):66–75, 1994. Place: New York, NY Publisher: ACM.
- [6] Wiklund Michael E. *Usability in practice: how companies develop user-friendly products*. AP Professional, Boston :, 1994. Book Title: Usability in practice : how companies develop user-friendly products.

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