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Robustness Analysis of Behavioral Cloning based Deep Learning Models for Obstacle mitigation in Autonomous Vehicles

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Abstract

Maneuvering a steady on-road obstacle at high speed involves taking multiple decisions in split seconds. An inaccurate decision may result in crash. One of the key decision that needs to be taken is can the on-road steady obstacle be surpassed. The model learns to clone the drivers behavior of maneuvering a non-surpass-able obstacle and pass through a surpass-able obstacle. No data with labels of "surpass-able" and "non-surpass-able" was provided during training. We have development an array of test cases to verify the robustness of CNN models used in autonomous driving. Experimenting between activation functions and dropouts the model achieves an accuracy of 87.33% and run time of 4478 seconds with input of only 4881 images (training + testing). The model is trained for limited on-road steady obstacles. This paper provides a unique method to verify the robustness of CNN models for obstacle mitigation in autonomous vehicles.

Biography:

Pranit Gopaldas Shah is currently in is final semester of Master of Technology in Computer Engineering from Parul University. Mr. Pranit has a Bachelor of Engineering in Mechinical Engineering and Computer Engineering. He is the director of TeerHub Technology Pvt. LTD, a premier AI company. His Company was ranked "50 Most promising Microsoft Services Providers 2019" by CIOReview, USA. He has presented in National Conference on Cluser Computing back in 2007, published in IJCSE in 2019 on "Computer Vision for Human Computer Interaction".

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