Optimizing Driving Algorithms for High Speed Autonomous Ambulances

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In our modern world, autonomous vehicles are becoming a more and more integrated part of society and day-to-day events. Due to this, it has become more essential to ensure that the autonomy of cars can be applied to specialized vehicles such as ambulances as well. This research primarily focuses on optimizing an algorithm for a self-driving car in order to make it applicable in a self-driving ambulance, as well as to observe and understand unpredictable situations that might result from the creation of self-driving ambulances. As opposed to previous research conducted, this project focuses on creating an algorithm that allows the robot to disregard some traffic rules in order to be as fast and as safe as possible in order to simulate an efficient real-life ambulance. This research was mainly conducted by optimizing navigation and motion control algorithms for a robot in Duckietown. The robot was then tested in a specialized simulation in various situations in order to test the algorithm. With these experiments, we were able to develop an algorithm that allows the robot to be as fast and as efficient as possible when avoiding any possible obstacles. These results lend more support to the implementation of autonomous ambulances in real-life, as these results successfully demonstrate the implementation of the algorithm. However, these results also point to certain uncontrollable variables, such as excessive light and human unpredictability, which might affect the implementation of this algorithm in real-life. Creating more understanding on these factors will allow us to observe patterns in them, which will allow for the creation of more robust and precise algorithms which will allow self-driving ambulances to be implemented in the real world.

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