

Evaluating the reliability of inexpensive hardware to test autonomous benchmarking problems

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Autonomous mobile robots are on the forefront of cutting-edge technology, taking advantage of recent developments in artificial intelligence, battery efficiency and sensor technology that all adds up to an expensive machine. Having low-cost, reliable systems is essential for autonomous researching and robotic development. We are using commercially available sensors combined with a pre-existing mobile base to produce an autonomous robot that is cost effective but still guarantees reliable performance. We are testing the practicality of this idea by implementing three different sensors into a small electric ride on vehicle. The first step is to ensure communication between the sensors, a computer, and the vehicle's motors. One part of this is done using a small Arduino board that takes inputs from the computer and sends the output to the motor through the preexisting connection between the vehicle's motors and a controller. Integrating these three sensors together is crucial to make an effective robot, they all must take in information and it must be sorted, made sense of, and depending on certain sensor conditions information will be sent to the car's motors. This framework is an essential contribution for future researching problems and will evaluate the reliability of simple autonomous benchmarking problems: map generating, localizing, and path planning.