

Abstract

Autonomous vehicles have applications in every walk of life. The challenge of creating a vehicle that could perform simple driving tasks such as lane following and lane changing to avoid collision is a difficult one. This project examines and proposes a solution to that challenge. The solution constructed is addressed as a model, or simulation, of larger possibilities.

The solution system is developed from both an electrical and mechanical standpoint. The basic theory behind the design is that a microprocessor equipped with simple sensors and control systems can successfully provide actuation through mechanics to accomplish obstacle avoidance, lane acquisition, lane following, lane changing based on lane conditions, and even lane re-acquisition when necessary.

Results indicate that lane following systems of unparalleled possibilities are possible. A model system has been constructed that performs the above tasks listed as the basic theory behind the design. This system on a larger scale with complex systems could drive on roadways and shuttle people around town.

The contribution of this work is laying a foundation for larger scale road vehicle autonomous mobility. The project permits future design efforts a working prototype system, which provides a baseline capability for continued research.