ABSTRACT

Artificial intelligence (AI) technology is revolutionizing the automotive sector, driven by the fourth industrial revolution. A milestone in this field was Google's self-driving car in 2011, followed by innovations from Tesla, Uber, and Volvo. In the automotive sector, AI creates automation systems capable of making adaptive decisions through deep learning algorithms and the integration of various sensors. The development process requires long-term research and development, and therefore, students play a crucial role in this technological innovation. This capstone design aims to develop a test prototype that can validate concepts such as lane detection, positioning systems, deep learning, and distance detection.

This capstone design focuses on the development of an Autonomous Unmanned Ground Vehicle (AUGV) that can navigate predetermined routes and avoid existing obstacles. The AUGV prototype is designed to operate in a campus environment. Testing, validation, and data analysis are conducted to ensure that the AUGV can operate well on the created routes.

The results of this capstone design indicate that the AUGV prototype has successfully achieved automatic maneuvering systems, obstacle recognition and avoidance, as well as location monitoring. However, despite these accomplishments, the development of the AUGV prototype still has system limitations. The produced AUGV prototype cannot yet be fully integrated into a more complex system. Therefore, further development is needed to improve and refine the system to reach a higher level of functionality and reliability before it can be fully implemented in real-world applications.

Keywords : Autonomous Unmanned Ground Vehicle, Artificial Intelegence, Deep Learning, Distance Detection, Global Positioning System

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