Self-Navigated Vehicle for Industrial Applications

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This study presents the innovation of the industrial autonomous navigation system. AVG installation consist of several building components; the vehicle, safety system, battery charging system, communication system, navigation system, traffic management system, job control system and other external components. Each of these systems has provided a specific function. Specially navigation system has provided the ability for the vehicle to identify its position. AGVs have to make decisions on path selection. The sensors installed on its on-board computer possessed all the data to calculate the position and orientation of the AGV. Sensors also capable of detecting magnetic markers made of tape of opposite polarity. Every AGV has a mapping system and a copy of the route map stored in its on-board computer. The route map contains routes, obstacles and pick up and drop up points. The encoders mounted on each wheel of AGV able to measure the steering angle and count the number of wheel revolution. Usually magnetic tape used as a path selection technique in AGVs. Here the position is identified using IMU (Inertial measurement unit) module. In here Euler angels were used to find the direction. Conventionally IMU module produces enormous noise and not enough accurate to use in specific applications. But in this study, the noise of IMU module is decreased and the accuracy is increased by the Kalman filter and the algorithm was built by us. The main purpose of this research is to make a more reliable automated industrial vehicle which can use and install easily. The sticking problems and maintaining difficulties are avoided. This modified AGVs have a high degree of flexibility to transfer material to the destined position. They only recharge when there is a gap in their auto planning and their recharge is a dynamic process. AGV provide an accurate and predictable material delivery, handling loads at different heights, complete routines, flexibility, clear aisles and organized workstations (Grid navigation) and its safe for people and loads.

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