Efficient Autonomous Guided Vehicle for Transporting Material in Sri Lankan Industry

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Autonomous Guided Vehicles (AGV) are used frequently in production lines for transporting various materials. Most of the times these AGVs are been controlled by Programmable Logic Controllers (PLCs), RobotQ, RaspberryPi and Arduino platforms. In SriLanka, most of the times apparel industry used the small size of AGVs to transport various materials. The intention of the research is to develop an AGV which is rich with path following, low turning radius, self-battery charging, PID controlling in a rough environment for Sri Lankan industry rather than specifying the apparel industry. A PLC has used here to control the overall process of the AGV. There is a special hooking mechanism and push-pull mechanism which are controlled by Programmable Logic Controller (PLC). AGV follows the paths of magnetic tapes which are located on the floor. Starting and stopping positions will be detected by the AGV and the loading and unloading will occur. Loading and unloading mechanism will be done by using a linear actuator. There is a special linear actuator which can be used as a special jack in the AGV. Overall AGV system is run by using a drive unit which consists of two brushless direct current motors (BLDC). An 8-bit magnetic sensor array is used to detect the path of the AGV. Future developments will be added to this AGV with digital image processing and artificial intelligence (AI).

Keywords: AGV, PID, BLDC, AI