

Development of a VG10 Electric Vacuum Gripper for Collaborative Robots

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Abstract: In recent few years grippers are widely used for various tasks/jobs in different fields. A gripper is a device which allows the holding of an object to be manipulated according to the requirement of application (machine tending, food processing or packaging, assembly, Etc). Gripper operates with the cobots for handling and manipulating the objects from one place to another place. Robot integrated manufacturing has turned out to be the future of manufacturing and automation technology. Operator assisting robots can perform simultaneous operation including machining, assembly, inspection, material handling etc. and in some case multiple operations in the same system at a faster and precise rate. Collaborative robots i.e., cobots are human and computer-controlled material handling device which facilitates the concept of shared workplace. This project focuses on the design of cobotic grippers for pick and place application, the different concepts compared a suitable design is chosen. The gripper moves according to the signals received from the cobot, sensors and PLC control system.

Keywords: Gripper; Collaborative robots; types of grippers; Design of vacuum cups, design of Vg10 electric vacuum gripper

REFERENCES

- [1] Hasimah Ali, Tei Chen Seng, Low Hoi Hoi, Mohamed Elshaikh University Malaysia Perlis “Development of Vision-Based Sensor of Smart Gripper for Industrial” Applications” 2012 IEEE 8th International Colloquium on Signal Processing and its Applications.
- [2] J. D. TEDFORD Department of Mechanical Engineering, University of Auckland, Auckland, New Zealand “DESIGN OF A ROBOT GRIPPER WITH FORCE FEEDBACK CONTROL” Received 14 February 1991; accepted 1 March 1991.
- [3] Bjartmar Freyr Erlingsson, Ingólfur Hreimsson, Páll Indriði Pálsson, Sigurður Jóhann Hjálmarsson, Joseph Timothy Foley a, * “Axiomatic Design of a linear motion robotic claw with interchangeable grippers” The 10th International Conference on Axiomatic Design, ICAD 2016.
- [4] Lisheng Kuang, Yunjiang Lou, Senior Member, IEEE, and Shuang Song, Member, IEEE “Design and Fabrication of a Novel Force Sensor for Robot Grippers” IEEE SENSORS JOURNAL, VOL. 18, NO. 4, FEBRUARY 15, 2018.
- [5] Shiuh-Jer Huang*, Wei-Han Chang, and Jui-Yiao Su “Intelligent Robotic Gripper with Adaptive Grasping Force” International Journal of Control, Automation and Systems 15(X) (2017) 1-11.
- [6] Roxanne Anderberg, Rickard Holm “SIMPLIFIED SENSOR SYSTEM FOR AN INTELLIGENT ROBOTIC GRIPPER” Thesis for the Degree of Master of Science in Engineering – Robotics June 1, 2016.
- [7] Shiuh-Jer Huang*, Wei-Han Chang, and Jui-Yiao Su “Intelligent Robotic Gripper with Adaptive Grasping Force” International Journal of Control, Automation and Systems 15(X) (2017) 1-11.