

Gripping an object based on inspection of slip events for a robotic hand model

ABSTRACT

An effective grasping operation is required in intelligent robotic hands to address the well-known challenge that occurs during the gripping process. One of the most important issues is detecting and addressing the slip situation; otherwise, stable grasps will not be achieved properly. This study investigated robotic re-gripping operations based on slip event indication. Tactile pressure sensors are utilized to discover the physical interaction between robotic claws and a particular object during the gripping operation. Slip signal detection is executed by implementing a rotary encoder device that was provided in a robotic hand model. The robotic system has attempted to accomplish the re-gripping mission autonomously. Therefore, an automatic feedback control algorithm is developed to perform re-gripping tasks based on the distance at which an object has slipped. Experimental findings present the correlation between the required forces for an object to re-grip securely and the distance at which an object has slipped. This approach was demonstrated as Hooke's law.

Keyword: Re-gripping operation; Robotic hand model; Slip detection device; Tactile pressure sensors