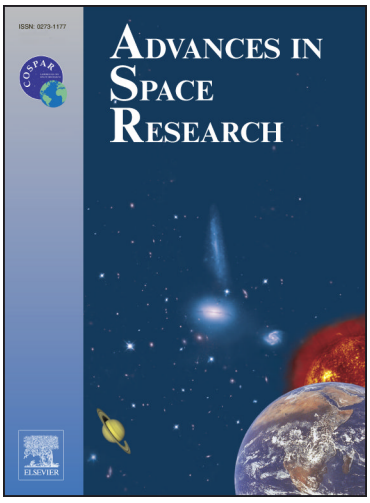

Design and Fabrication of Robotic Gripper for Grasping in Minimizing Contact Force

Hamidreza Heidari, Milad Jafary Pouria, Shahriar Sharifi, Mahmoudreza Karami

PII: S0273-1177(17)30900-6
DOI: https://doi.org/10.1016/j.asr.2017.12.024
Reference: JASR 13557

To appear in: *Advances in Space Research*

Received Date: 13 December 2016
Revised Date: 15 December 2017
Accepted Date: 17 December 2017

Please cite this article as: Heidari, H., Jafary Pouria, M., Sharifi, S., Karami, M., Design and Fabrication of Robotic Gripper for Grasping in Minimizing Contact Force, *Advances in Space Research* (2017), doi: https://doi.org/10.1016/j.asr.2017.12.024

Design and Fabrication of Robotic Gripper for Grasping in Minimizing Contact Force

Hamidreza Heidari[1]*[1], Milad Jafary Pouria[1], Shahriar Sharifi[1], Mahmoudreza Karami[1]

1. Mechanical Engineering, Malayer University, Malayer
* Malayer, P.O.B. 65719-61446, hr.heidari@malayeru.ac.ir

The main contribution of our paper is in **Robotic Gripper field** with some highlights as following:

- A new method for the improvement and design of the kinematic structure of a robotic hand for successful grasping is presented.
- The main goal is to increase the grasping capability of large objects, decrease the contact forces.
- The design and fabrication of a human-inspired robotic hand with under-actuated and mechanical compliance is investigated.
- Some experimental tests are performed to examine the effectiveness of the hand-made in real, unstructured tasks.

Abstract

This paper presents a new method to improve the kinematics of robot gripper for grasping in unstructured environments, such as space operations. The robot gripper is inspired from the human hand and kept the hand design close to the structure of human fingers to provide successful grasping capabilities. The main goal is to improve kinematic structure of gripper to increase the grasping capability of large objects, decrease the contact forces and makes a successful grasp of various objects in unstructured environments. This research will describe the development of a self-adaptive and reconfigurable robotic hand for space operations through mechanical compliance which is versatile, robust and easy to control. Our model contains two fingers, two-link and three-link, with combining a kinematic model of thumb index. Moreover, some experimental tests are performed to examine the effectiveness of the hand-made in real, unstructured tasks**.** The results represent that the successful grasp range is improved about 30%

* Corresponding author.
E-mail address: hr.heidari@malayeru.ac.ir