IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.67
Volume 5, Issue 4, March 2025

A Survey on Real-Time Learning Robot for Shape Recognition for Objects using Multi-Fingered Robot Hands

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Abstract: *Robots with the help of wearable tactile sensing arrays as a primary source can have human like sensitive sense of touch, which helps them to response to environmental objects. This paper gives an overall review the optimal grasp planning of multi-fingered hands. In order to analyze multi-fingered grasp qualitatively, the contact models in common use are introduced and form closure and force closure are analyzed, then stable operation conditions of grasping are also proposed. This paper introduces three aspects of planning, which serves the purpose of how to make the optimal planning. The methods about the planning of grasping point location are presented, including geometric analysis based method, knowledge rules based method and optimization based method. The planning of grasping force is divided into optimization of grasping force in contact force space and optimization of grasping force in joint torque space. The planning of fingers gate is also analyzed. At the end of the paper, a few research comparison results are highlighted and discussed.*

Keywords: Bio-inspired design, artificial muscles, robotic fingers, MEMS tactile sensor

DOI: 10.48175/IJARSCT-24099