

# MECHATRONICS BOOK SERIES

## ROBOTICS AND AUTOMATION

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Rini Akmeliawati  
Wahju Sediono  
Nahrul Khair Alang Md. Rashid



IIUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

# **MECHATRONICS BOOK SERIES: ROBOTICS AND AUTOMATION**

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## **Editors**

Rini Akmeliawati  
Wahju Sediono  
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## CHAPTER 20

# Design and Development of Two Fingers Robotic Hand Actuated by Active Grasping Data

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### 20.1 Introduction

2-finger robotic hands (a gripper) is a part of robotic hand that physically interacts with the environment. Grippers are utilized to grasp object, usually the work piece, and hold it during the work cycle. Grippers of various types exist. If surface conditions allows, vacuum suction and electromagnetic gripper can be used, for example in handling automobile windshield and body parts in the factory. As gripper parts size exceeds the order of 100 gms, a gripper jaws are custom-made to ensure a secure hold (William, 2006).

Grippers, which act like a small pinchers, have two or three unarticulated fingers called jaws, which either pivot or remain parallel during open/close motions as illustrated in Fig. 1 below.

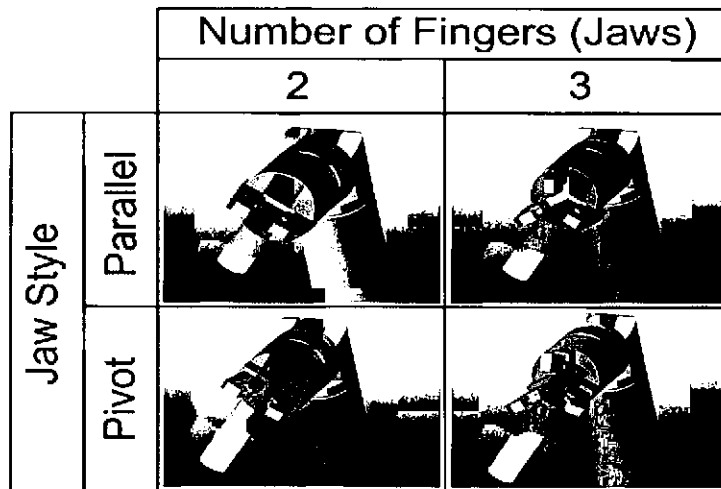


Fig. 1 Finger robotic hand

In this project however, the constructions of the gripper is more to human finger and less to the gripper found in pick and place robot. Even though the objective of gripping objects didn't change, the mechanism of human finger that is implemented in the design will allow further development of more complex gripping mechanism. Each joint and link in the robotic fingers is analogous to the real human hand.

Actual grasping is a task whereby the grippers are needed to grasp a physical object. The task can be represented by levels of task that need to be achieved. For example, the task of grasping, lifting and replacing a glass of water can be divided into several phases: