

## 3-D MANEUVER MOTION TRACKING ROBOTIC HAND

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### ABSTRACT

The objective of this project is to provide support where human life can and will be at risk in hypothetical situations. This device can work under high pressure, temperature, high-to-no-gravity. Applications for this tech lies on the hazardous phase where only such as alteration on the external of the space shuttle require astronauts to step out in the empty space with no oxygen where a small mistake can cause the persons life, now with this device can be prevented and alterations with ease, this is one minor case whereas can also be applied in underwater submarines, remote bomb defusing. The robotic hand device can be made with variety of metal and alloys with the respective of the purposes need to be fulfilled according to the necessity of the environmental factors. Since the hand is based on humans it is easy to control and access of flexibility is 360 degrees

**Keywords:** exoskeleton robotic hand, environmental-interdependence, efficient

### 1. INTRODUCTION

This projects applications are almost infinite from fixing space shuttles, defusing bomb from a safe distance, exploring in a existential planets. The device is built based on the design of a human hand so that maneuvering it will be not create any problem, since the design is based on human hand and it can be built on various elements the access and reach can be non-human and will be more helpful in various situations. The main reason for 3-D robotic arm provides an entirely new way of navigating computers and playing games using hand gesture control. The goal of the project is to apply this new technology to control an existing robotic arm and further understand the value and potential uses that may result from remote controlled technology in the real world.

### 2. LITERATURE SURVEY

Many inventions in the 20<sup>th</sup> and the 21<sup>st</sup> century is changed the perspective and traditional way of approach in this world and helped move further ahead. One of the greatest accomplishments in this era was The surgical device is a robot with multiple arms, which allows doctors to operate on a patients from distance. The doctor uses joysticks to move each arms to precise locations not possible even the steadiest human hands. Each arms is equipped with different tools including: cameras that allow the operator to see a three-dimensional view of the patient with ten times the zoom, surgical knives, and surgical tools. The 'da Vinci' allows for a faster and more precise surgery. The device also allows for minimal contact, which dramatically lowers risk of Infection.

### 3. WORKING PRINCIPLE

The robotic hand gets a constant flow of commands from the processor and the processor from the camera, accordingly the data is constantly being fed as the user constantly moves the hand and provides input to the system. The conditions for the robotic hand to reciprocate the functions will be in a minor 1/4<sup>th</sup> of the micro second delay standard and also varies depending on the processor and the element the robotic hand is constructed and the control flow of the design. The device had 6 degrees of freedom and no restriction (technically)

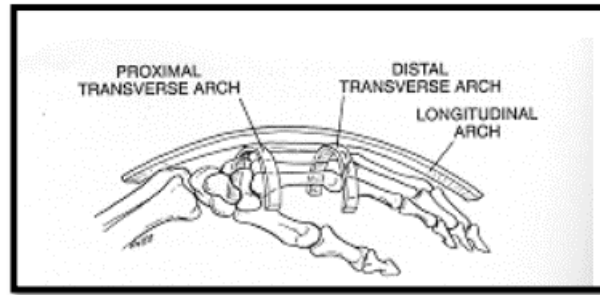


Figure 1: Robotic Hand

#### 4. EXISTING SYSTEM

A robot can be defined as “a programmable, self-controlled device consisting of electronic, electrical, or mechanical units. More generally, it is a machine that functions in place of a living agent.” For centuries, humans have been fascinated by the idea of robotics and automation. Today, universities, private companies, and military powerhouses work tirelessly to create human-like machines to do every day human-like tasks for us, as well as provide unique entertainment. Northrop Grumman is an American defense technology company. One of its directors, Phil Coker states that the CaMEL can run for 24 hours on three-and-a-half gallons of fuel, and can be equipped with a grenade launcher, an automatic weapon and anti-tank missiles. I can protect soldiers by eliminate targets up to 3.5 kilometers away using daylight telescopes and thermal imaging. This is an example of one of the robots that are estimated to join the field in the next five years.



Figure 2: self-controlled device of a robot

Atlas is designed to maneuver through rough terrain as well as move away any obstacle that stands in its way. He has twenty-eight degrees of freedom solely actuated through hydraulics that allow it to lift, manipulate, carry objects, and climb stairs with its hands and feet. Atlas’ head is equipped with stereo cameras and laser range finders that allow it to navigate through its environment. This is truly one of the highest pieces of robotic technology out there today



Figure 3: Automatic Robot

### 5. PROPOSED SYSTEM

The proposed system contains 5 servo motors individual for each specific finger and the motors are connected to the exoskeleton and according to the commands from the processor the motors contracts and retracts accordingly. The processor used in this device is arduino uno along with sensor board where the input data will be from the camera, it keeps tracking the hand of the user continuous and keeps feeding the data.the sensitivity of the robotic arm is calibrated according to its need and function with respective values.

The proposed the system contains camera constantly tracking the users in-motion hand and feeding the data to the processor, the processor checks the condition and according to the conditions and given control flow the data will be processed and transferred to the robotic hand and it replicates it accordingly

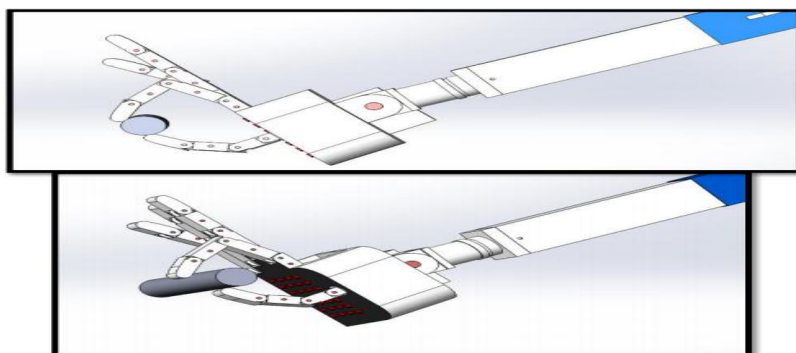
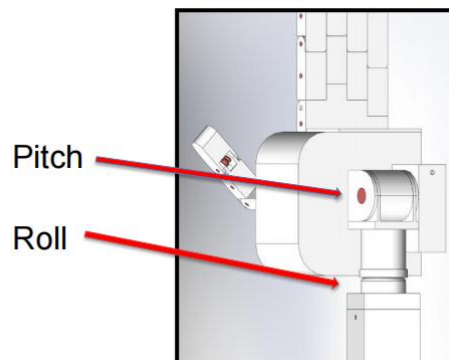


Figure 4: Operation of the Robotic Hand



**Figure 5:** Component of Robotic limb

## 6. IMPLEMENTATION

The device is made from plastic and can also be made with different elements too, the individual parts of the printed hands are connected through wires and few are welded, the wires are connected to the servo motor and is being operated by the processor where the processor gets the data or orders from the user directly through the camera.

## 7. CONCLUSION

The 3-D MANEUVER MOTION TRACKING ROBOTIC HAND application on the society will change many peoples life who are putting their life on the line to perform certain tasks such as repairs in the space shuttles, defusing bomb, under water repairs in vessels and etc. Any technology small or ground breaking with the perfect implementation can change the world a better place.

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