



# MEDXACT



MedXact is Highly  
precise medical  
Robotic Arm

Medical Robotic Arm system

# PROBLELEM

STATEMENT

Global Surgeon Shortage

INFECTION CONTROL

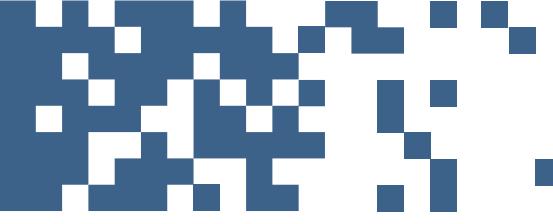
Human errors  
(need for precision)

Need for repetitive practice without risk to patients

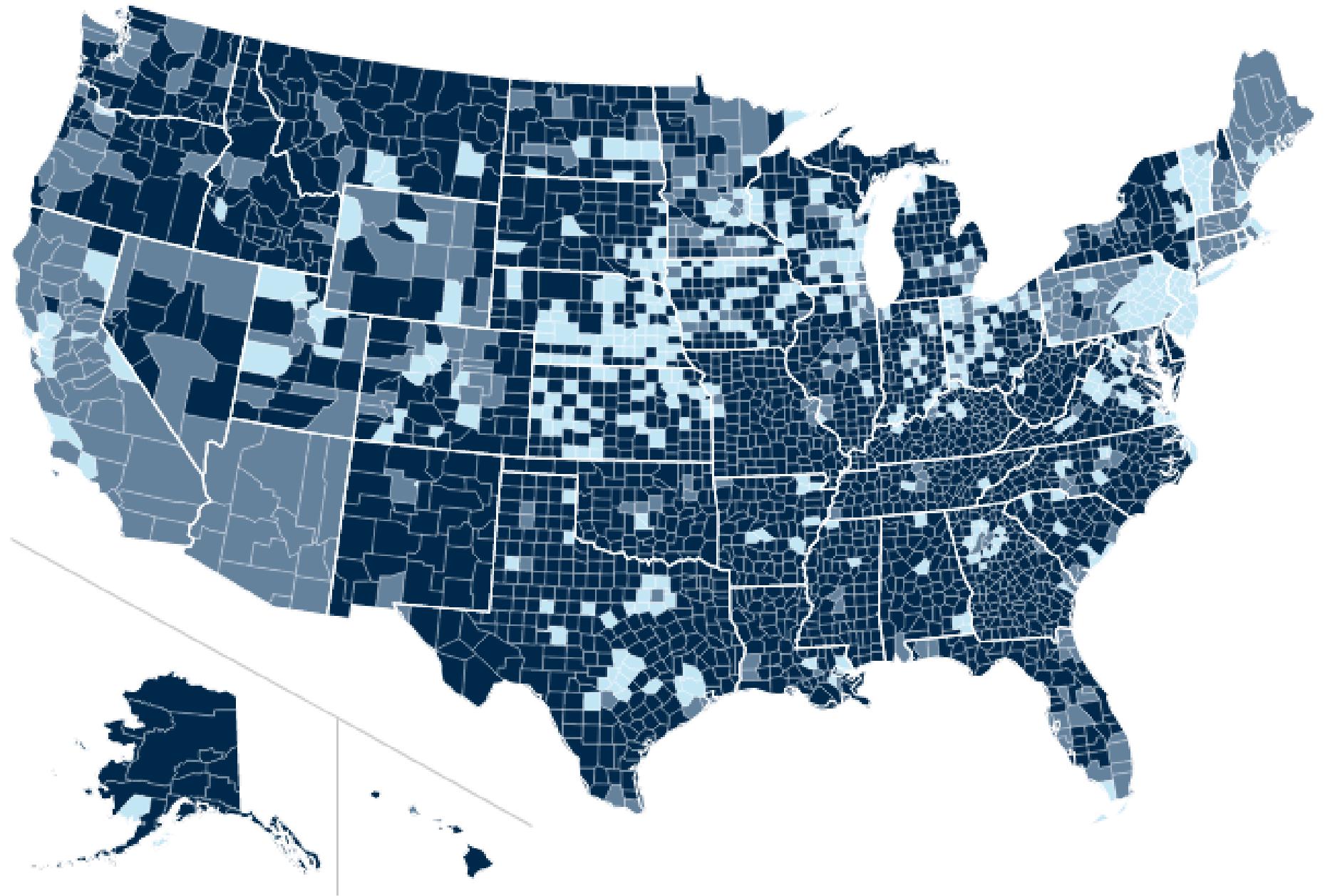
Challenges in Emergency or Remote Settings

High Costs of other Robotic system Surgery

# Global Surgeon Shortage Areas



Health Professional Shortage Areas: Primary Care, by County, October 2024

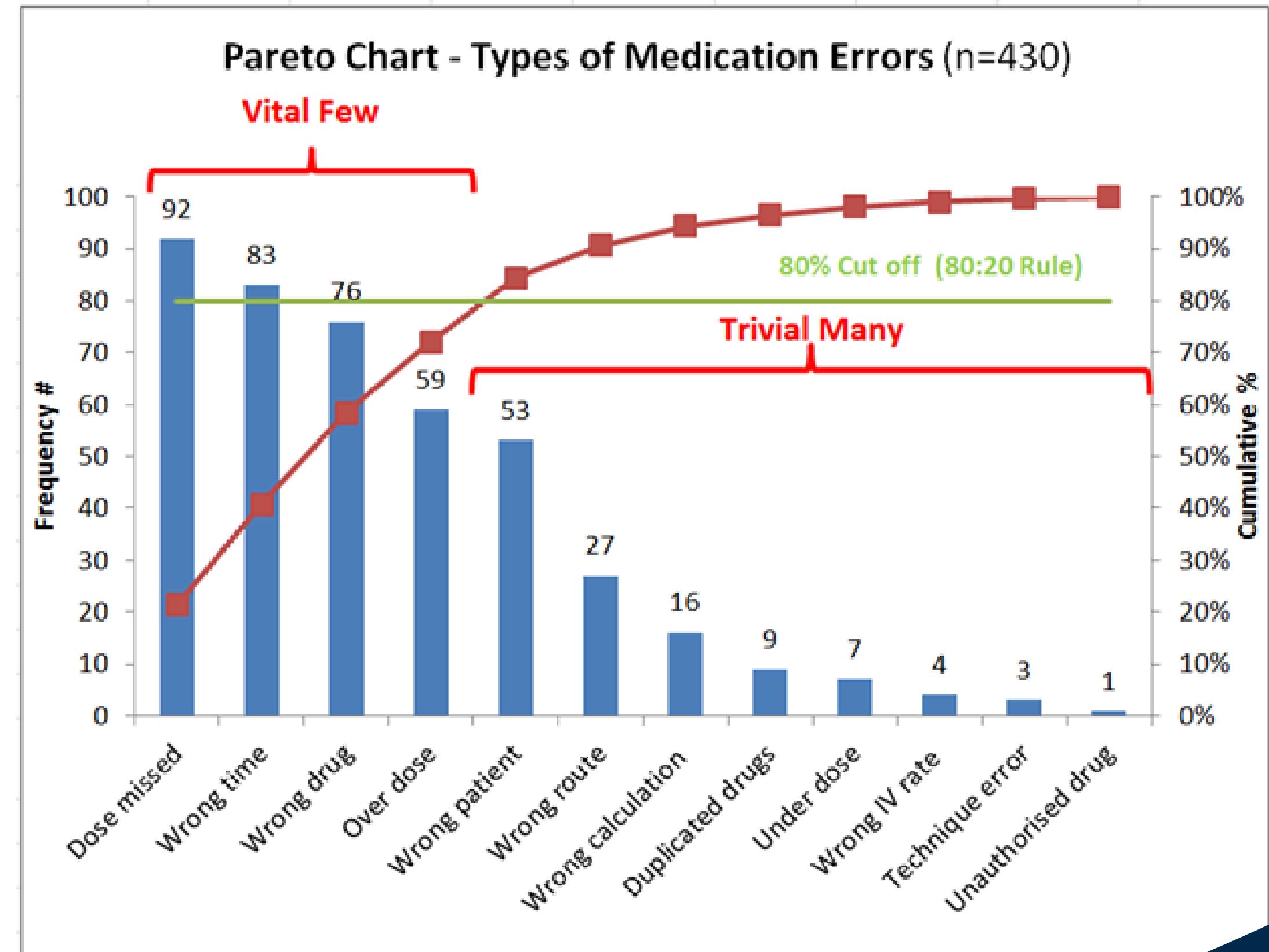


None of county is  
shortage area

Part of county is  
shortage area

Whole county is  
shortage area

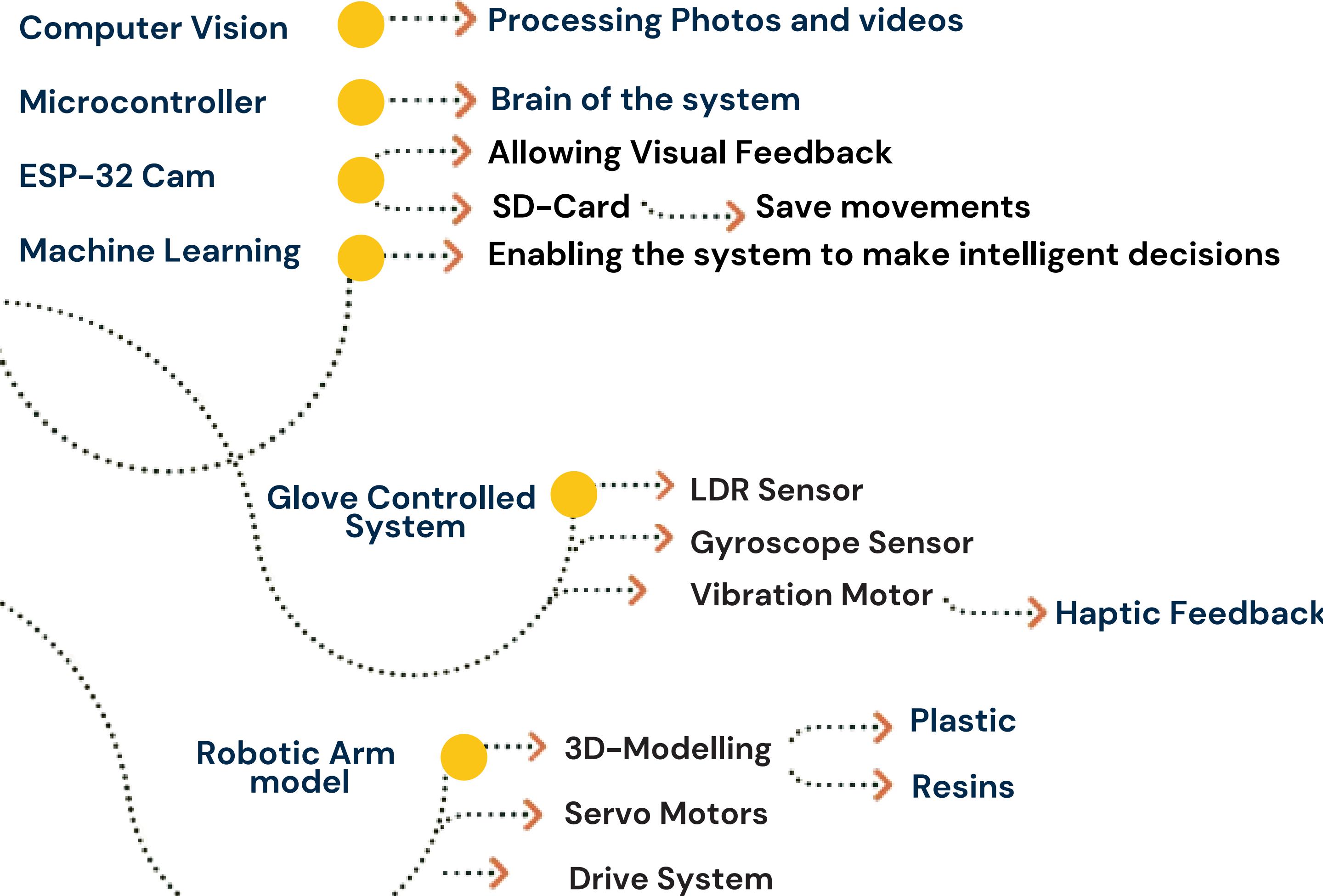
# Medical Errors Types and percentage



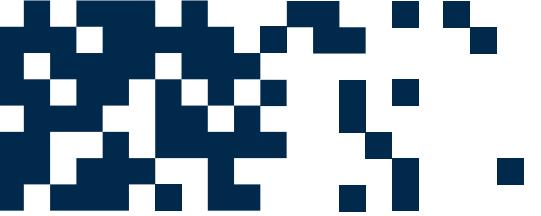
# Research Objective



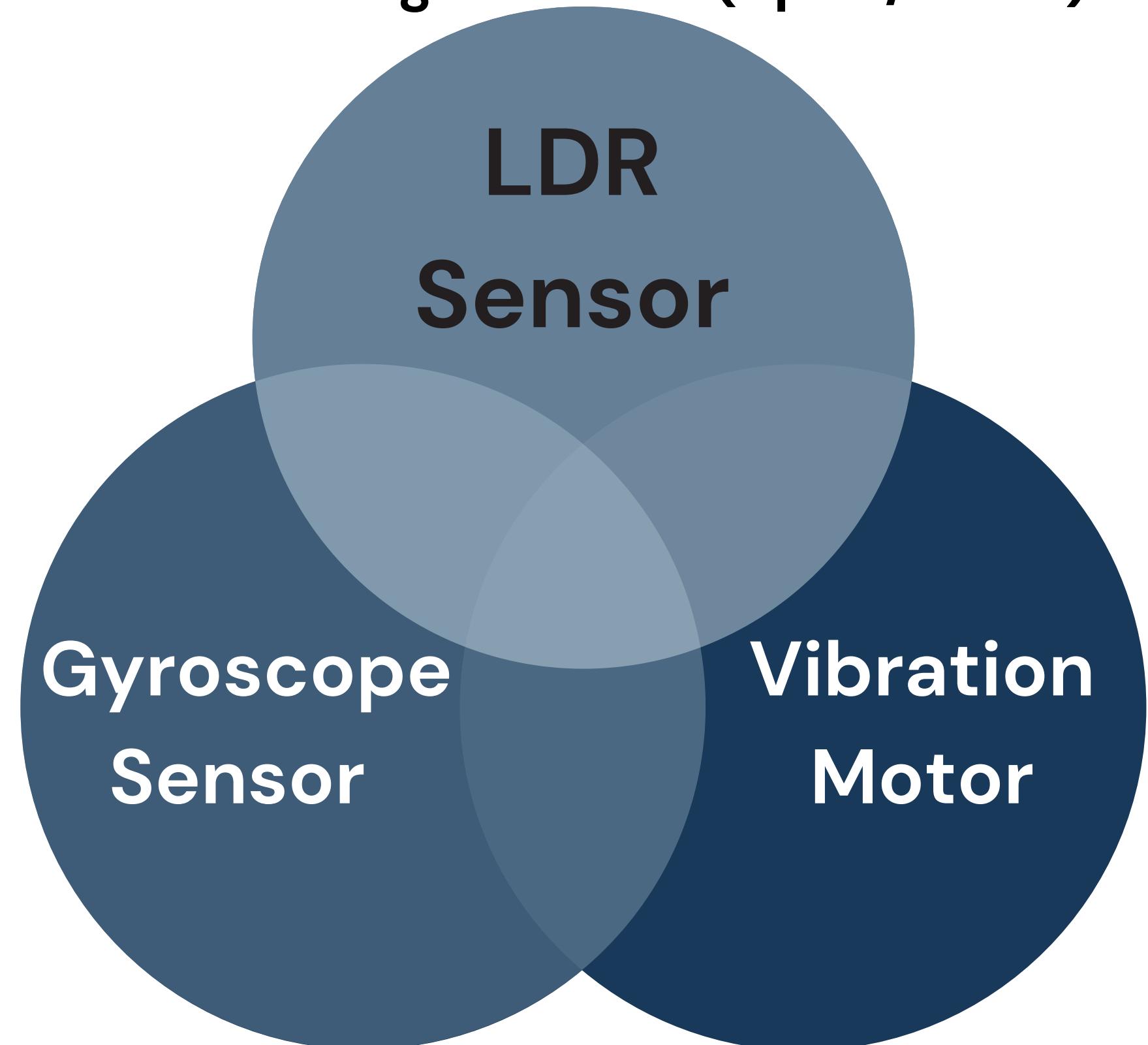
# MEDHACT OVERVIEW



# GLOVE MECHANISM



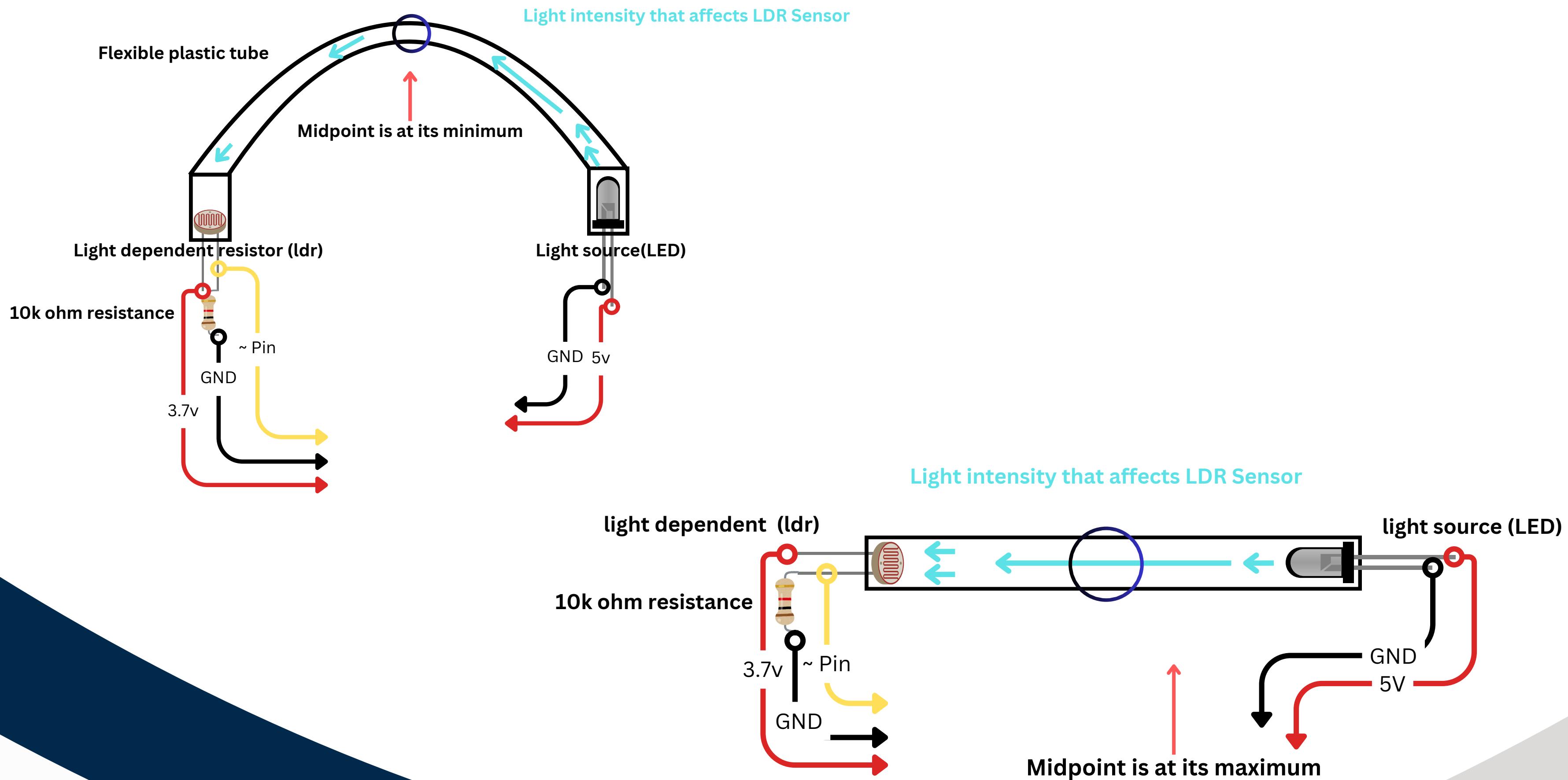
Detects light intensity changes  
when fingers move (open/close)



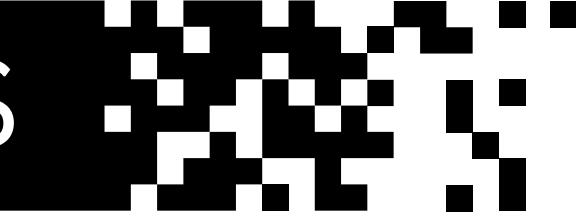
Determines the arm's orientation and direction

Detect levels of vibration created by user actions

# LDR SENSOR MECHANISM



# GLOVE MODIFICATIONS

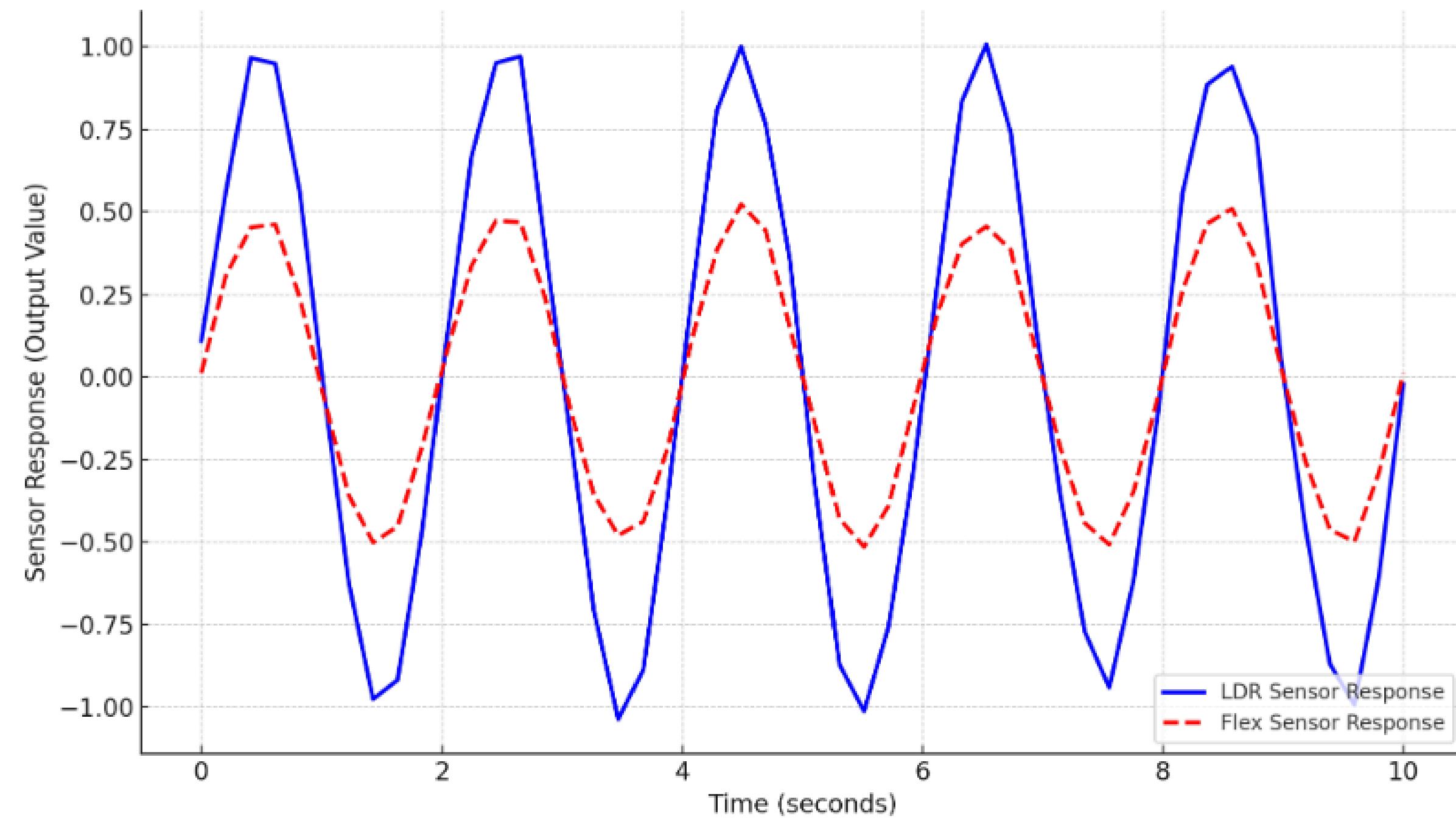


## Flex Sensor VS LDR Sensor

Accurate , Fast new sensor

Much lower cost

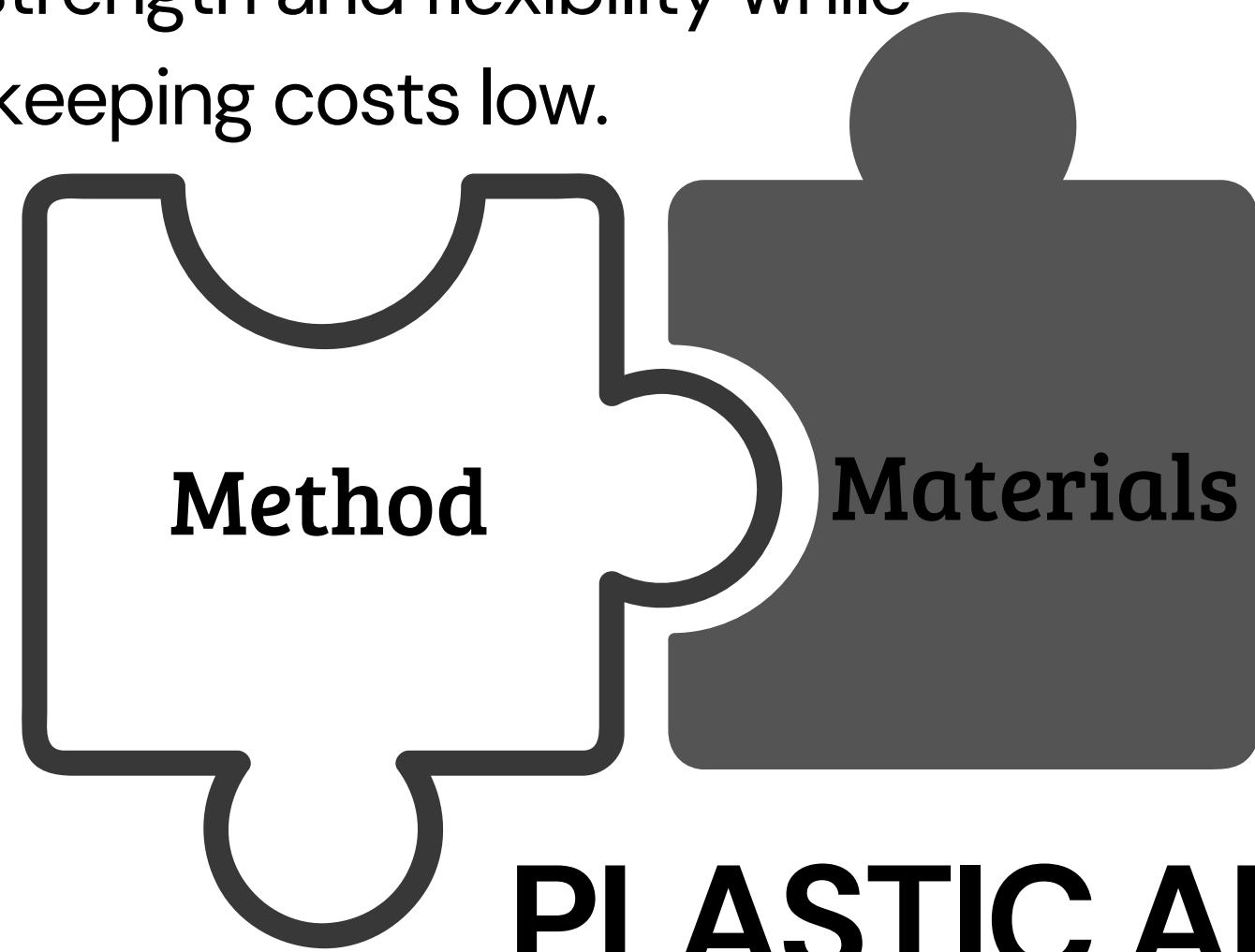
high precision



# 3D PRINTED MODEL

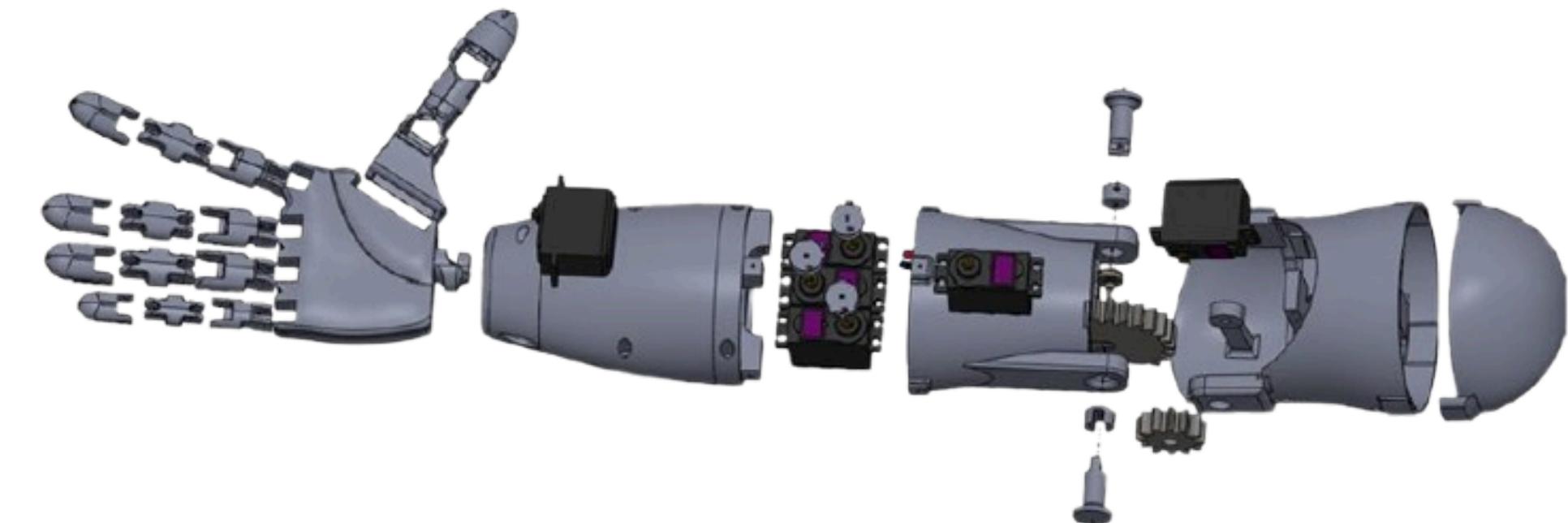
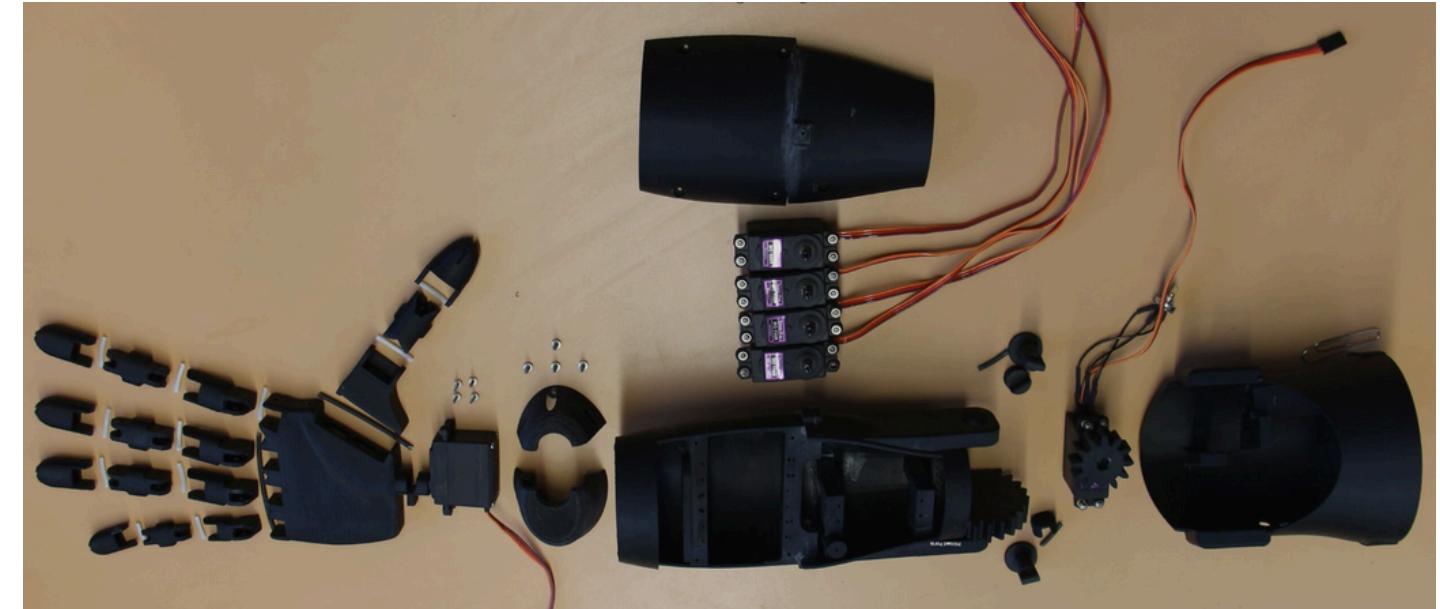
## 3D-Printing

ensures strength and flexibility while  
keeping costs low.



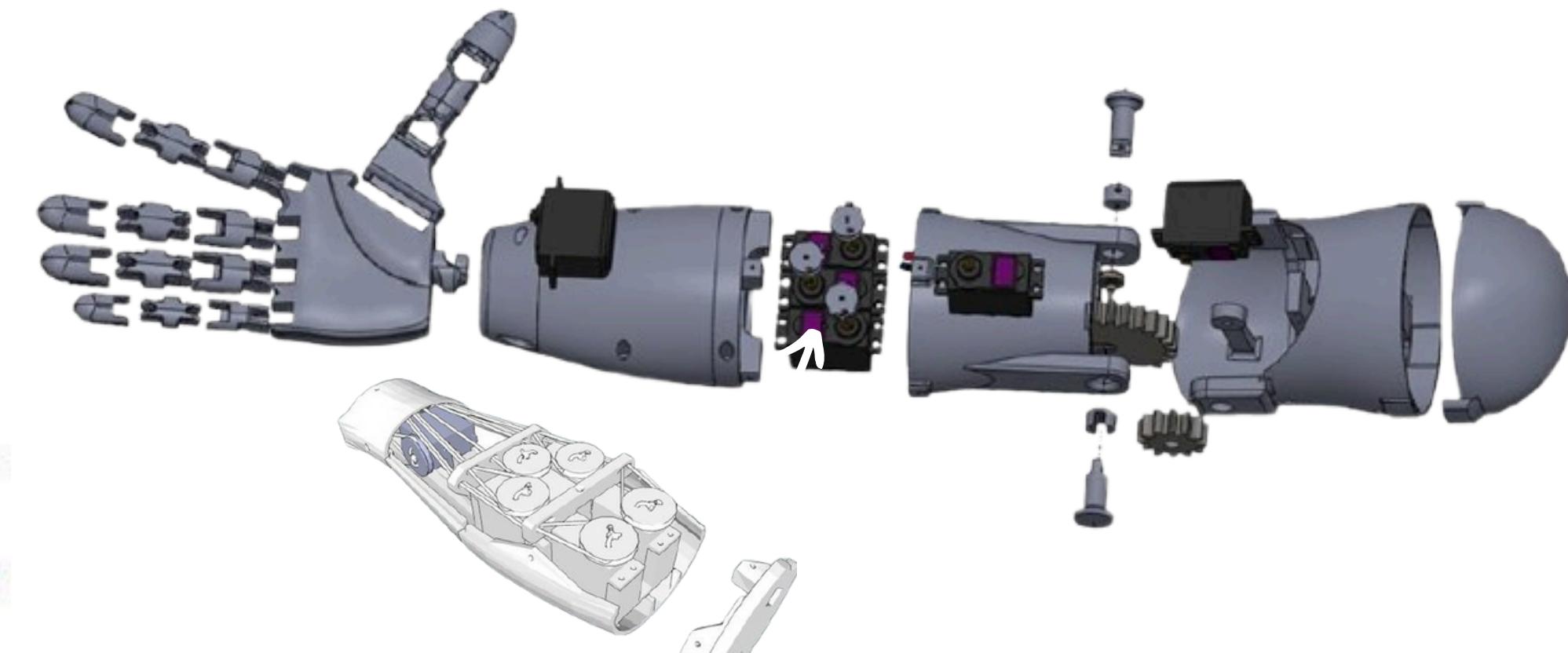
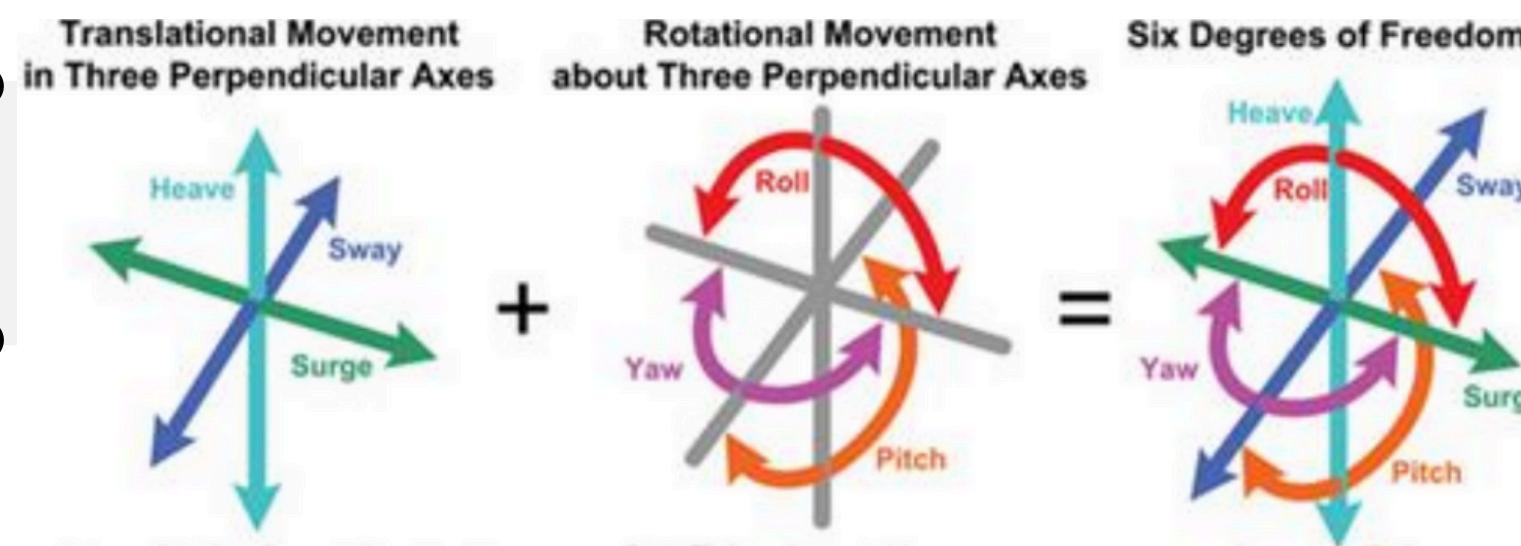
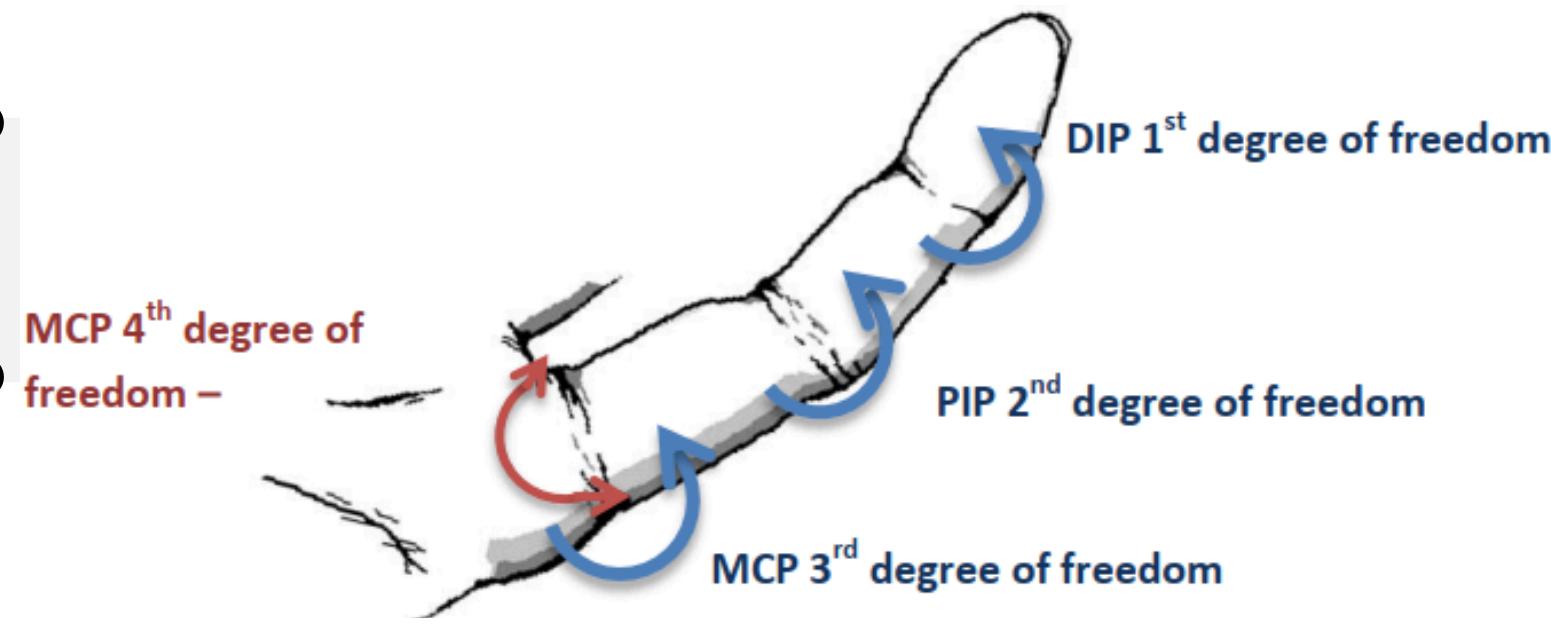
## PLASTIC AND RESIN

Reduces manufacturing costs compared  
to traditional robotic arm systems

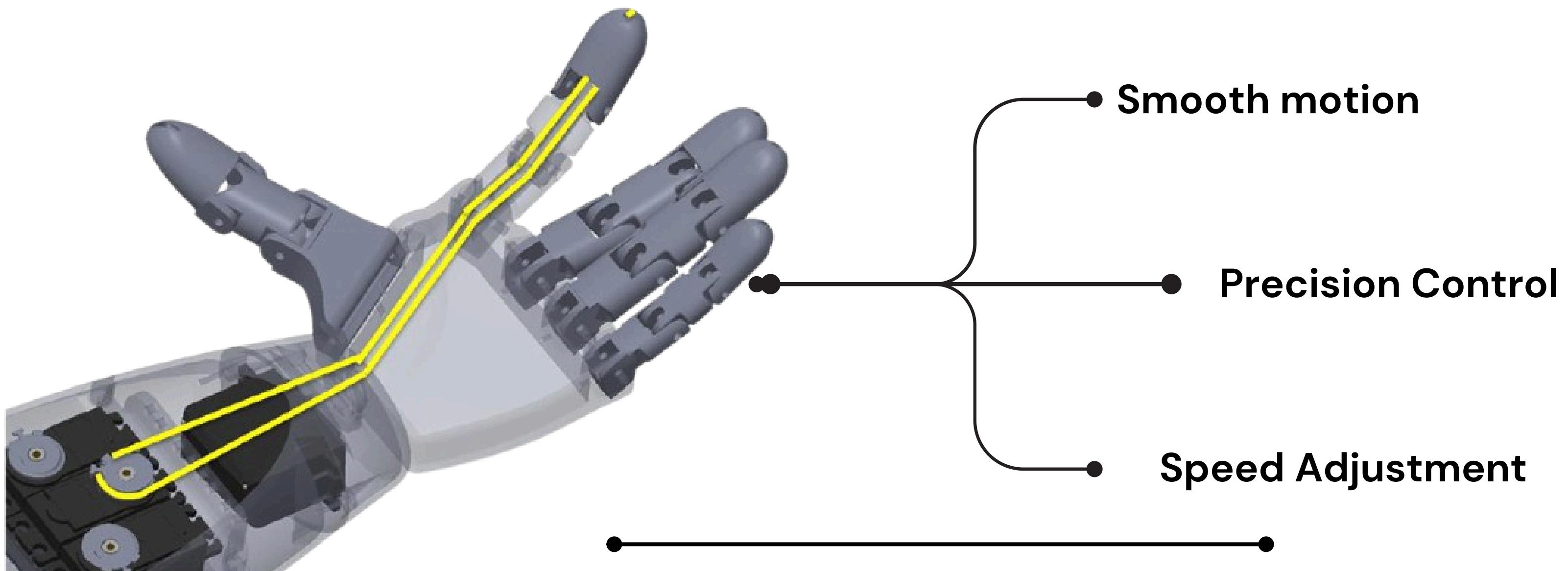
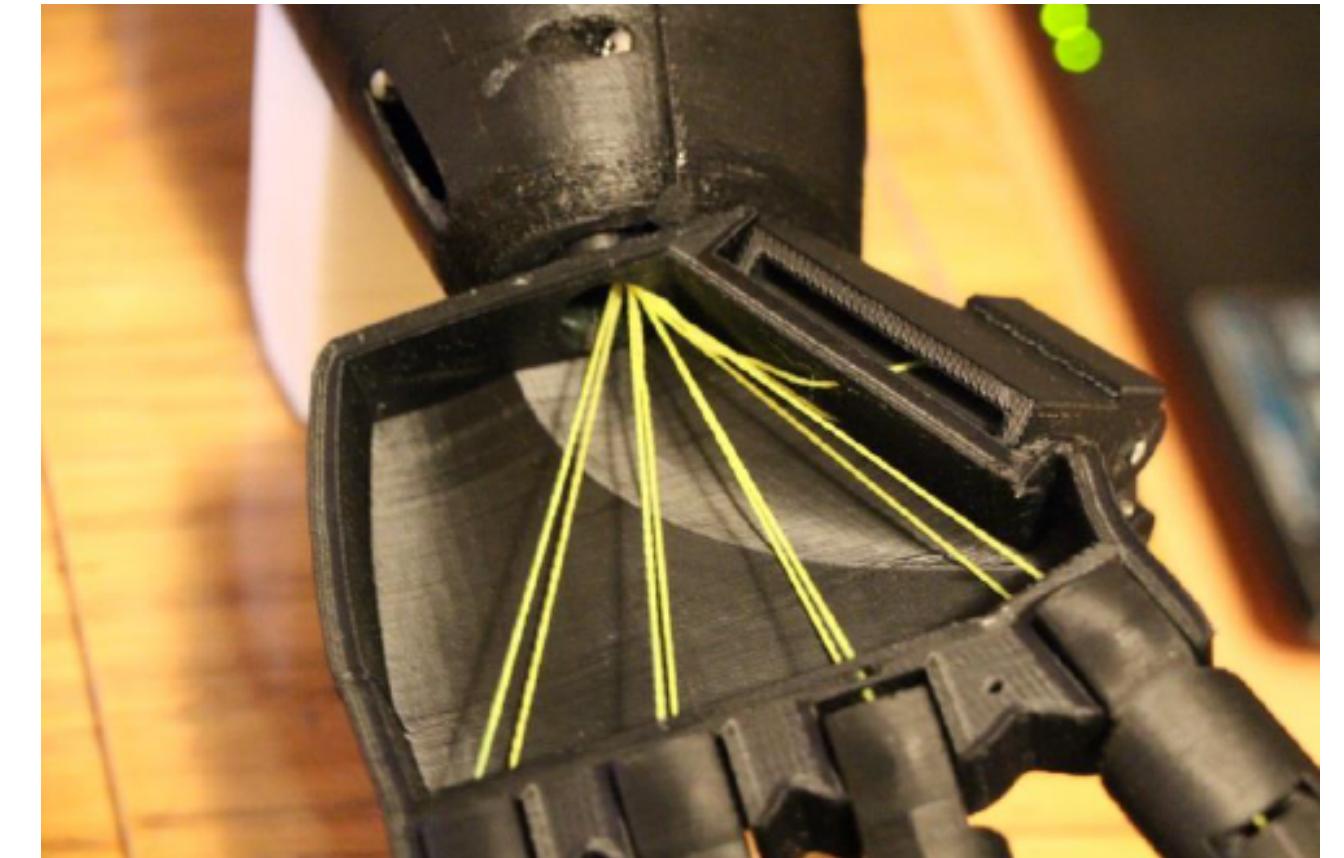


# SERVO MOTORS

Responsible for various degrees of freedom

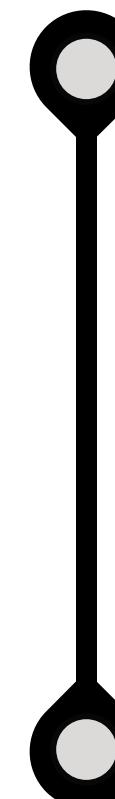
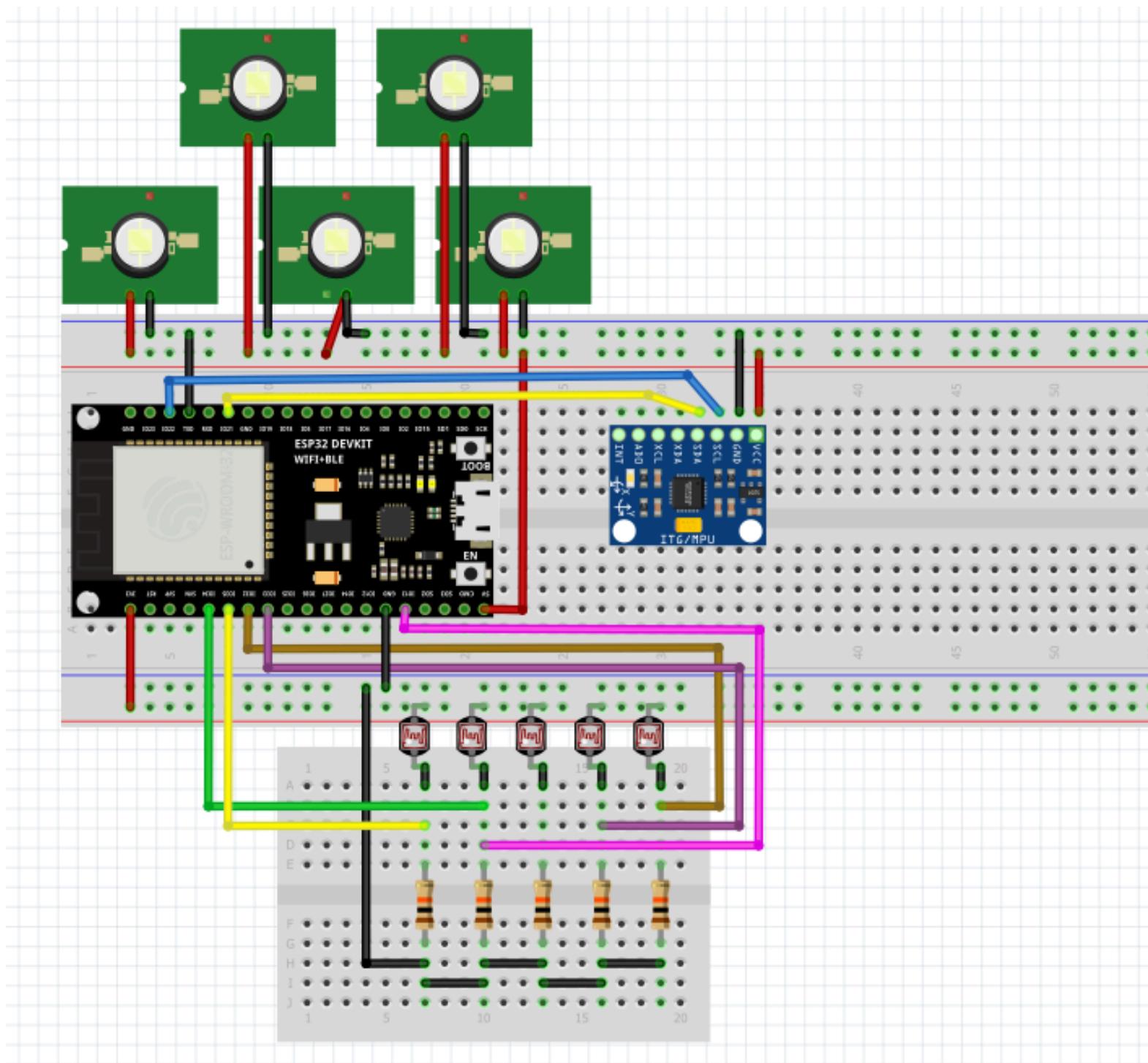


## Drive System Using Tendons and Servo Horns

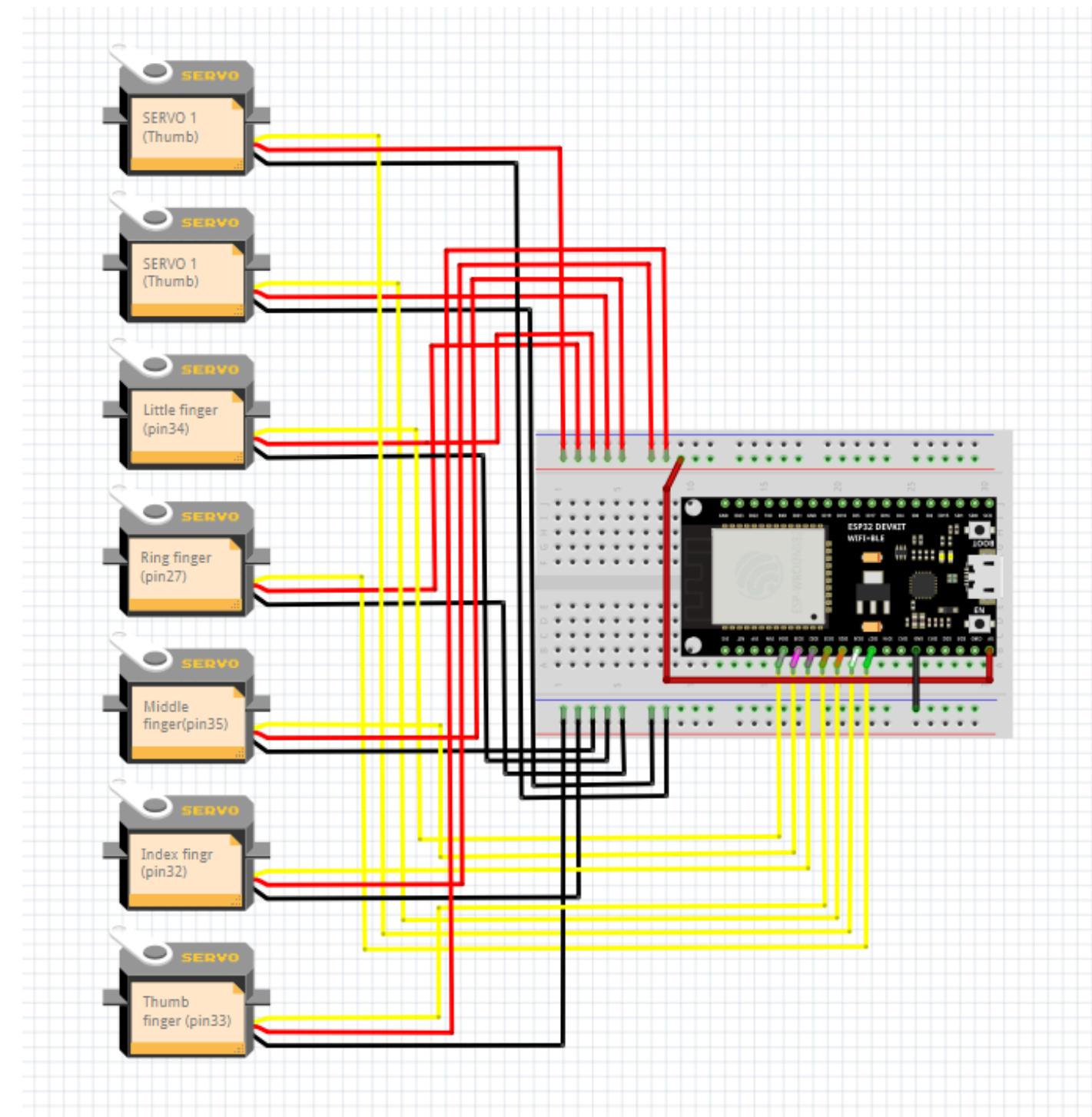


# CONNECTIONS AND ELECTRONICS

## Glove connections



## The 7 servo motors



# ESP-32 CAM

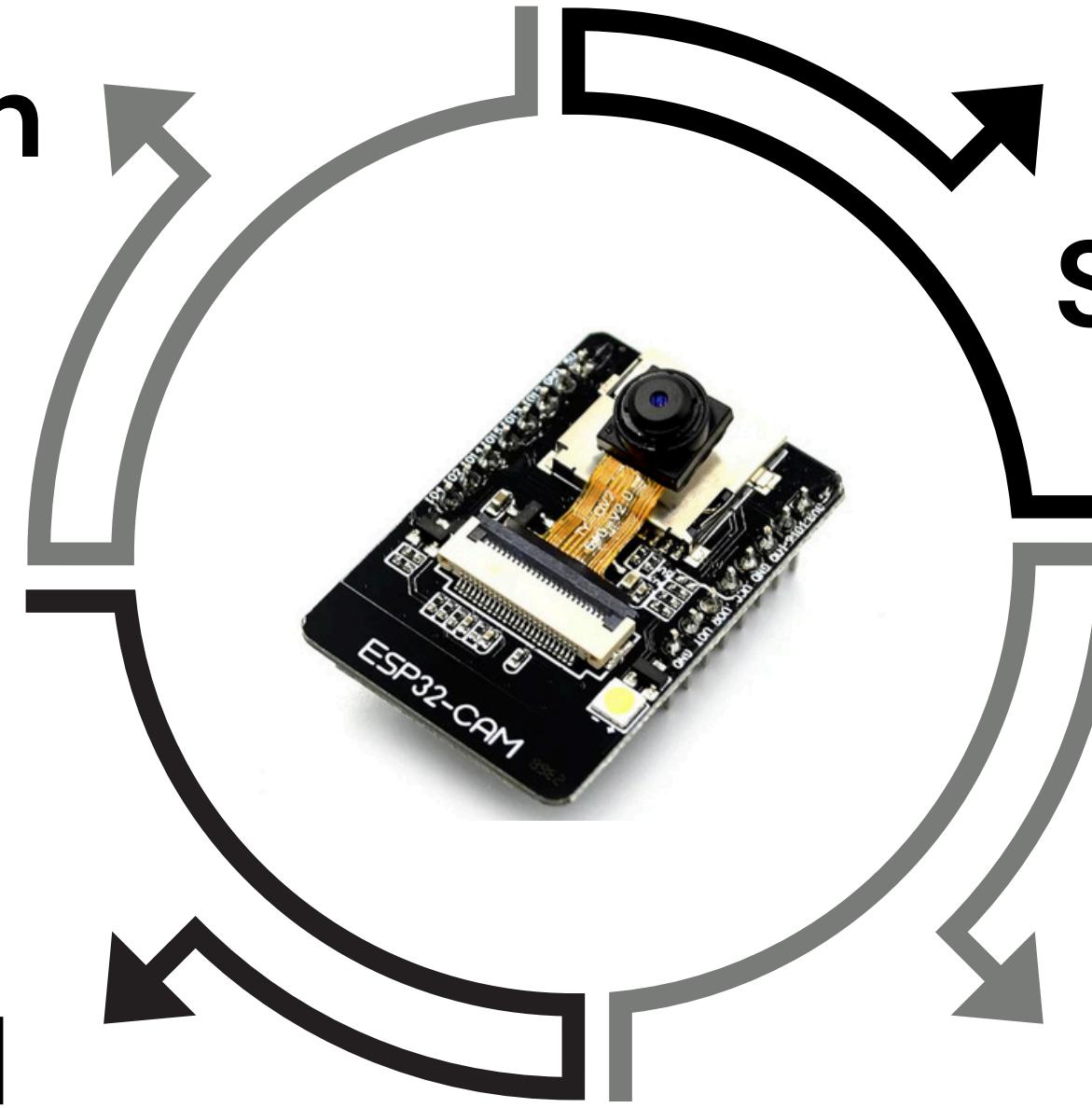
**Object detection**

**Supports Wifi**

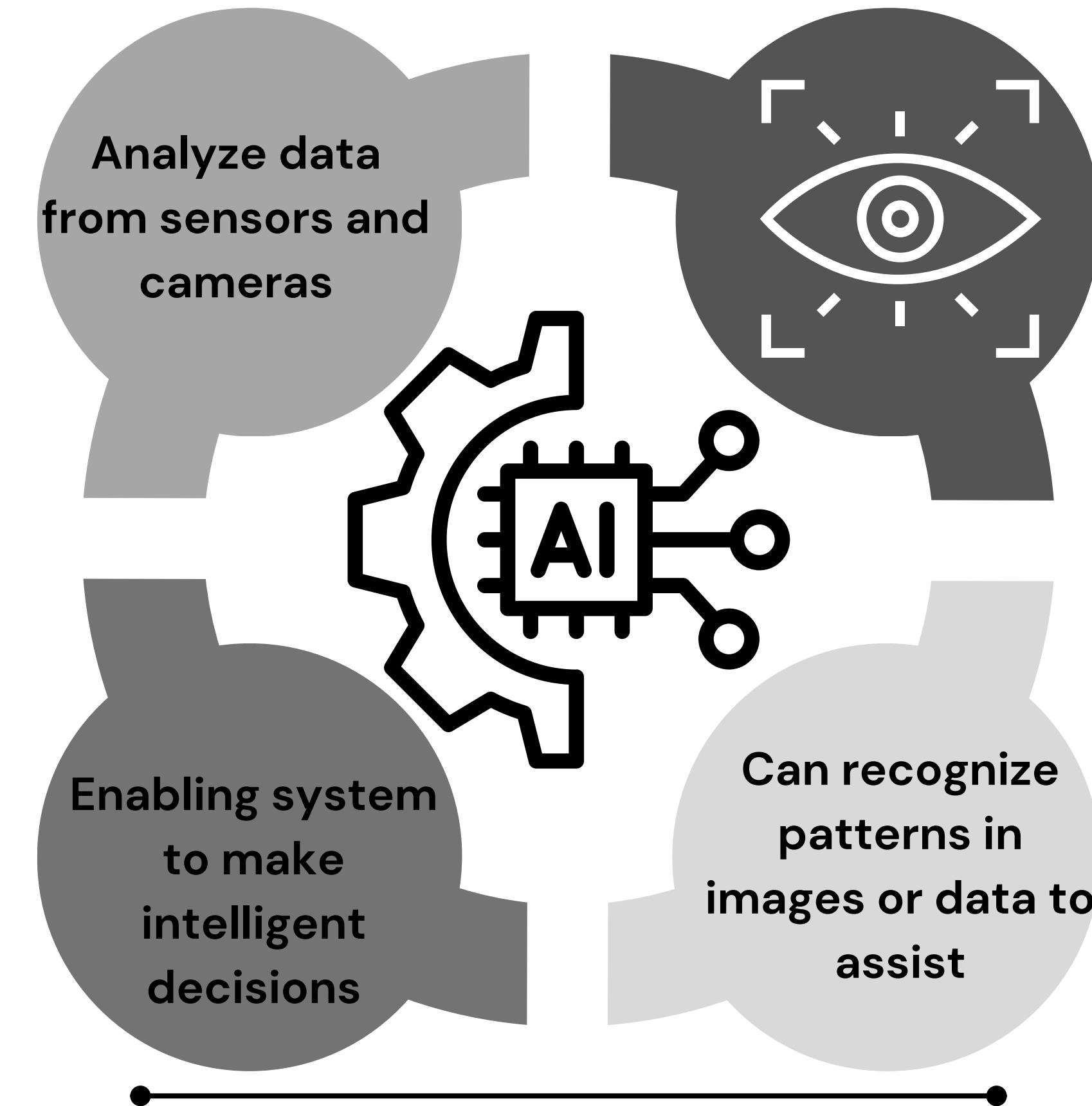
**Supports Bluetooth**

**Micro SD-card  
(save movements)**

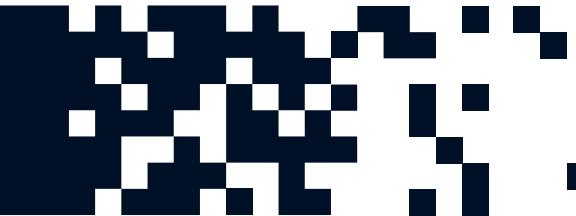
**Real-Time Videos**



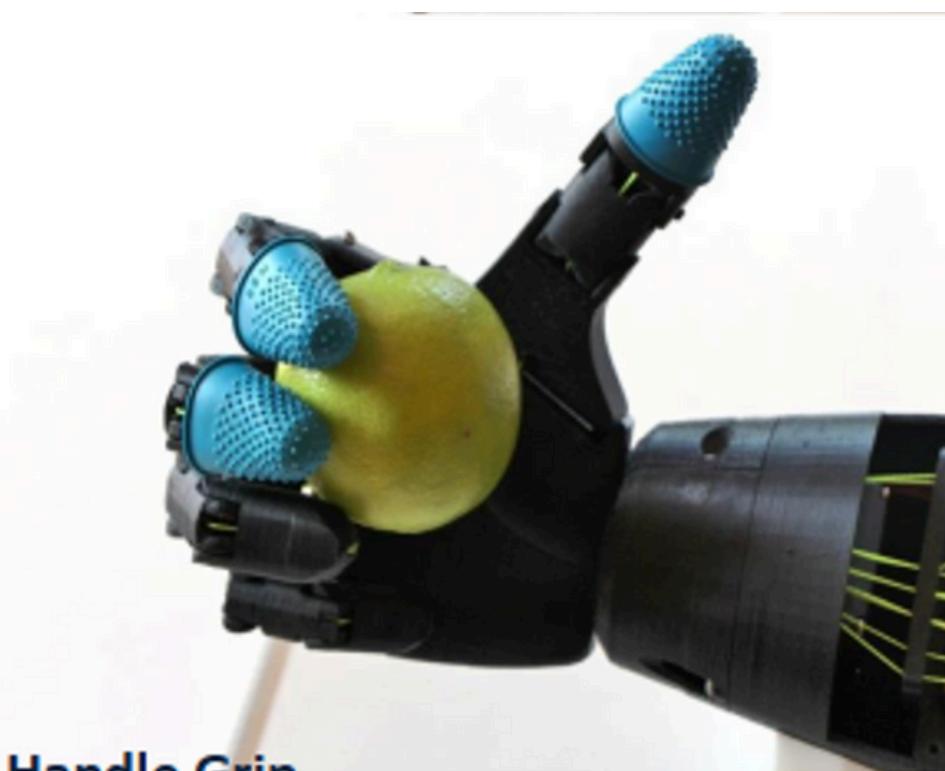
# AI and Computer Vision



# 3D ARM MODEL



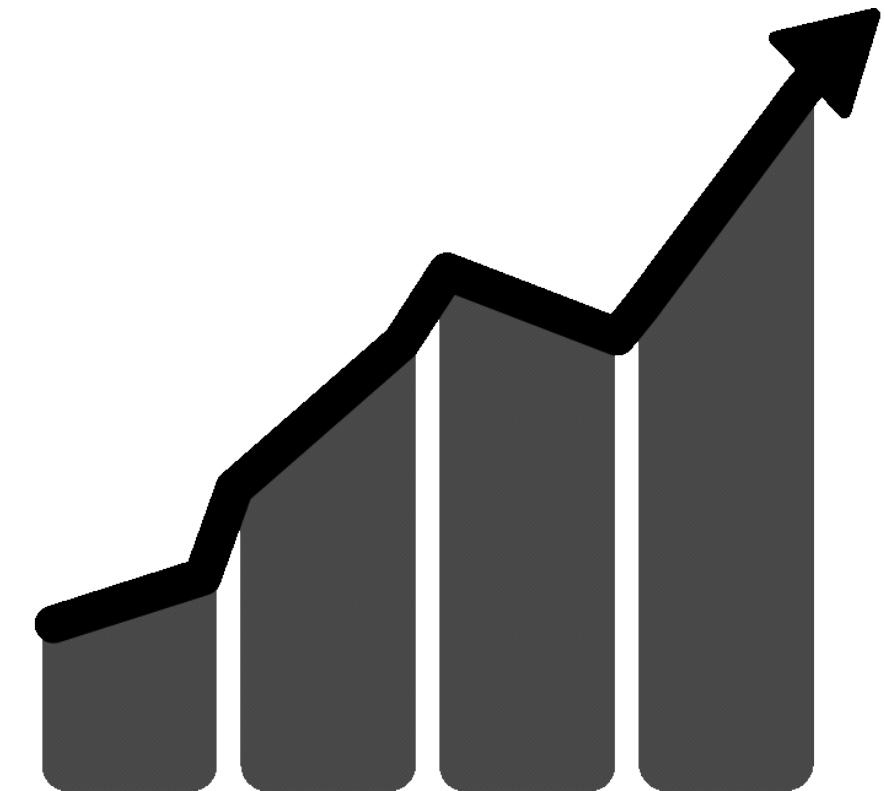
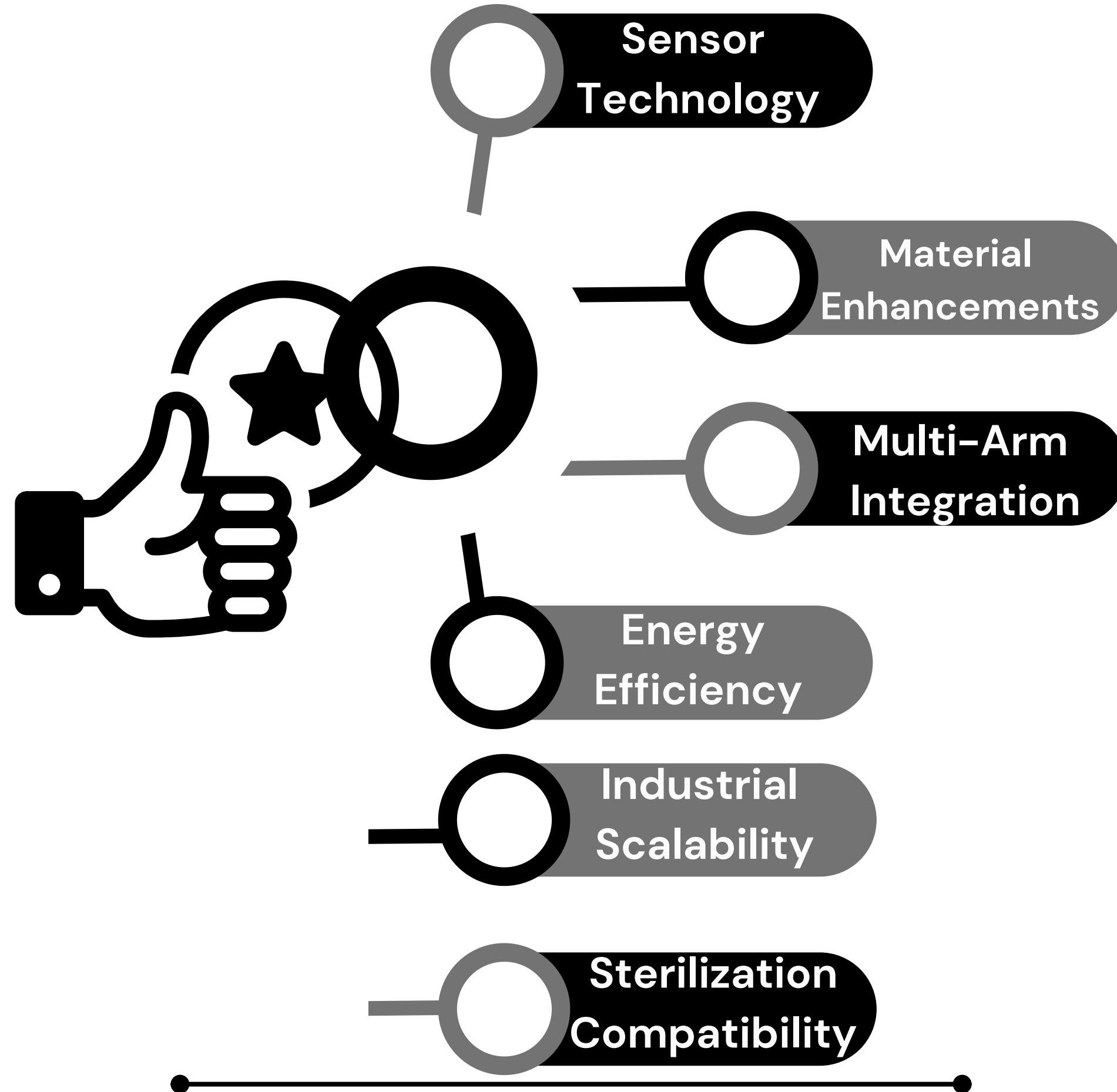
Test 1



MEDXACT ARM



# Recommendations



# Conclusion

