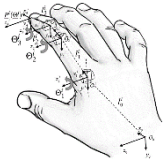# Cyber Glove

System architecture and implementation plan

- Preetham Reddy G

1. Objectives revisited
2. System configuration
3. Human Hand anatomy
4. Mechanical design
5. Hardware architecture
6. Software architecture

Objectives Revisited

Accurate enough estimation of kinematics.

Proposed Solution :
- **Use of Exoskeleton with rotational encoders for finger kinematics**
- **And IMU for Yaw ,Pitch and Roll motion capturing**

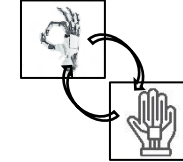**Ergonomic design of glove**

Proposed Solution :
- **Design of exoskeleton without affecting any DOF of hand**

Integration of haptic feedback in the glove

Proposed Solution :
- **Use of Exoskeleton with Ratchet mechanism to provide digital force feedback.**
- **Use of vibration motors for tactile feedback (touch)**

Communication between Glove and robotic hand

Proposed Solution :
- **WIFI connectivity for Line of sight connectivity**
- **Use of internet for Long distance communication through wifi**
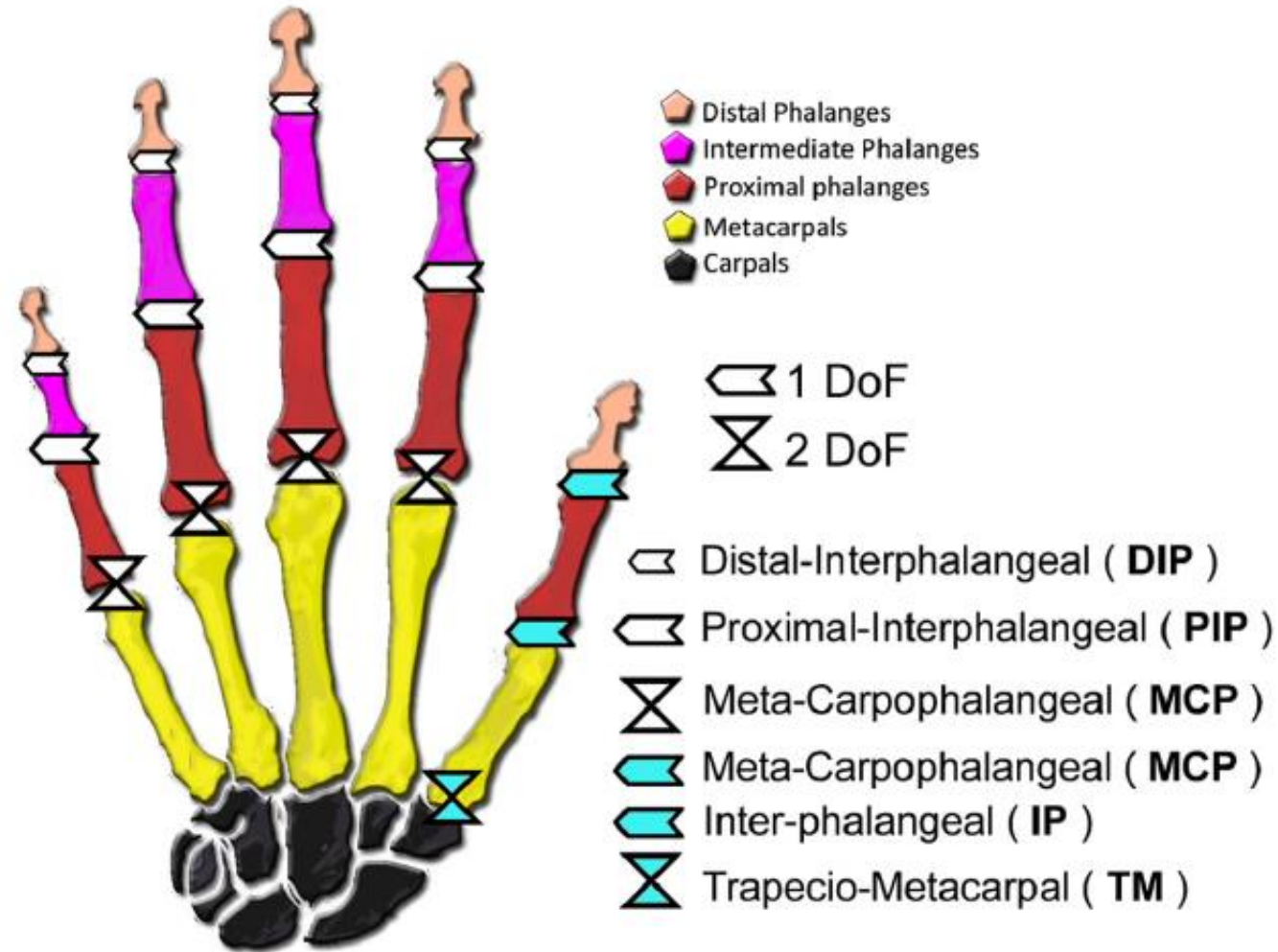
Human Hand anatomy

Figure 1. Human hand model.

System Configuration

Exoskeleton configuration : Mechanical system designed around dynamic system(hand) which mimics the motion of that dynamic system(hand) without restricting the DOFs.

- Easy to apply rigid body dynamics and kinematics to estimate the finger kinematics.

- Rotary encoders can be used which are very cheap (potentiometer)

- Excellent for "Force feedback". exoskeleton helps in restricting the motion of fingers in controlled manner
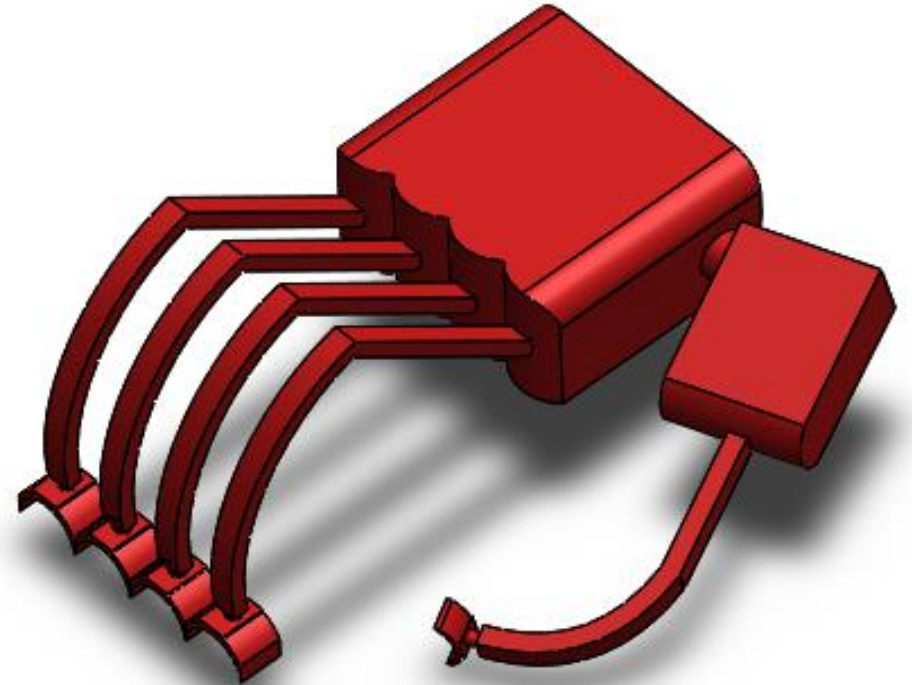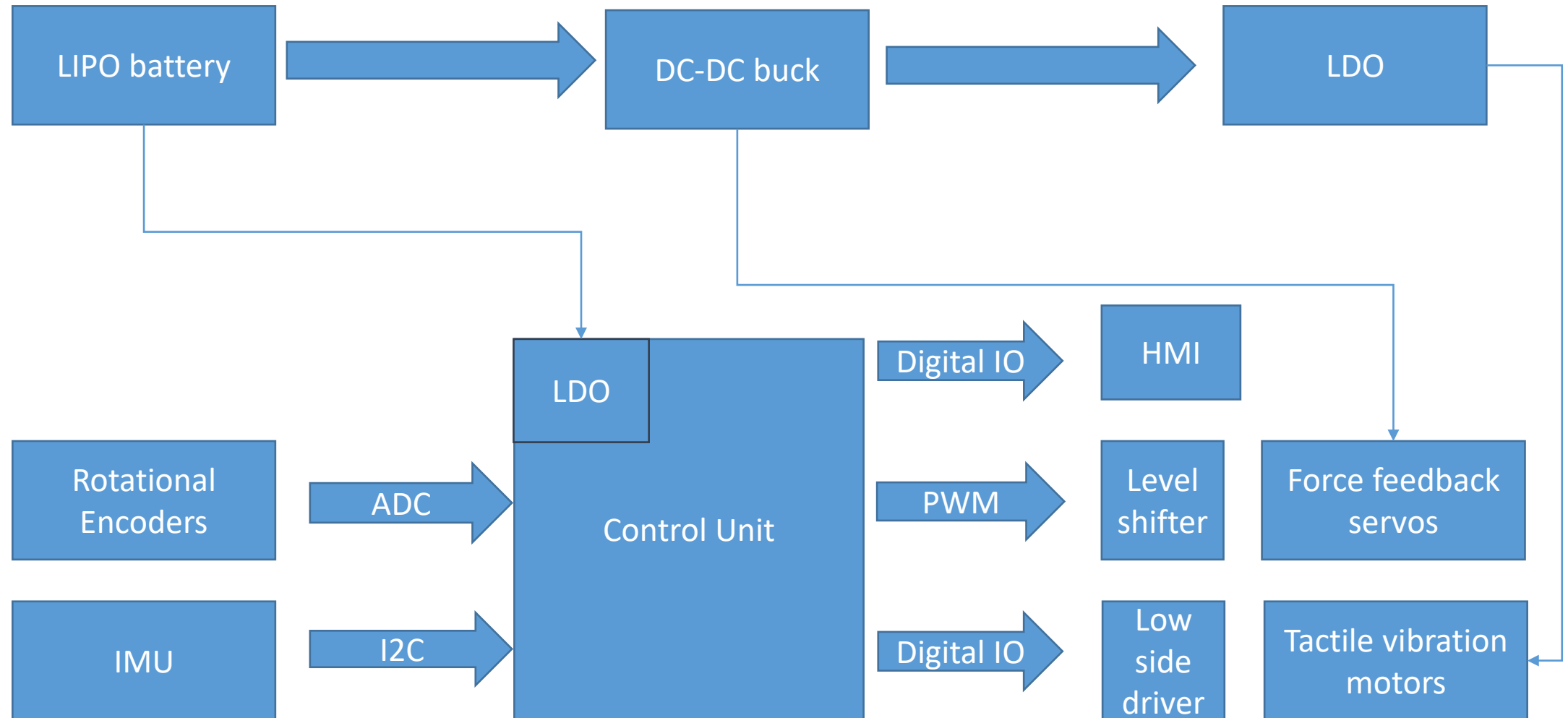
Mechanical Design

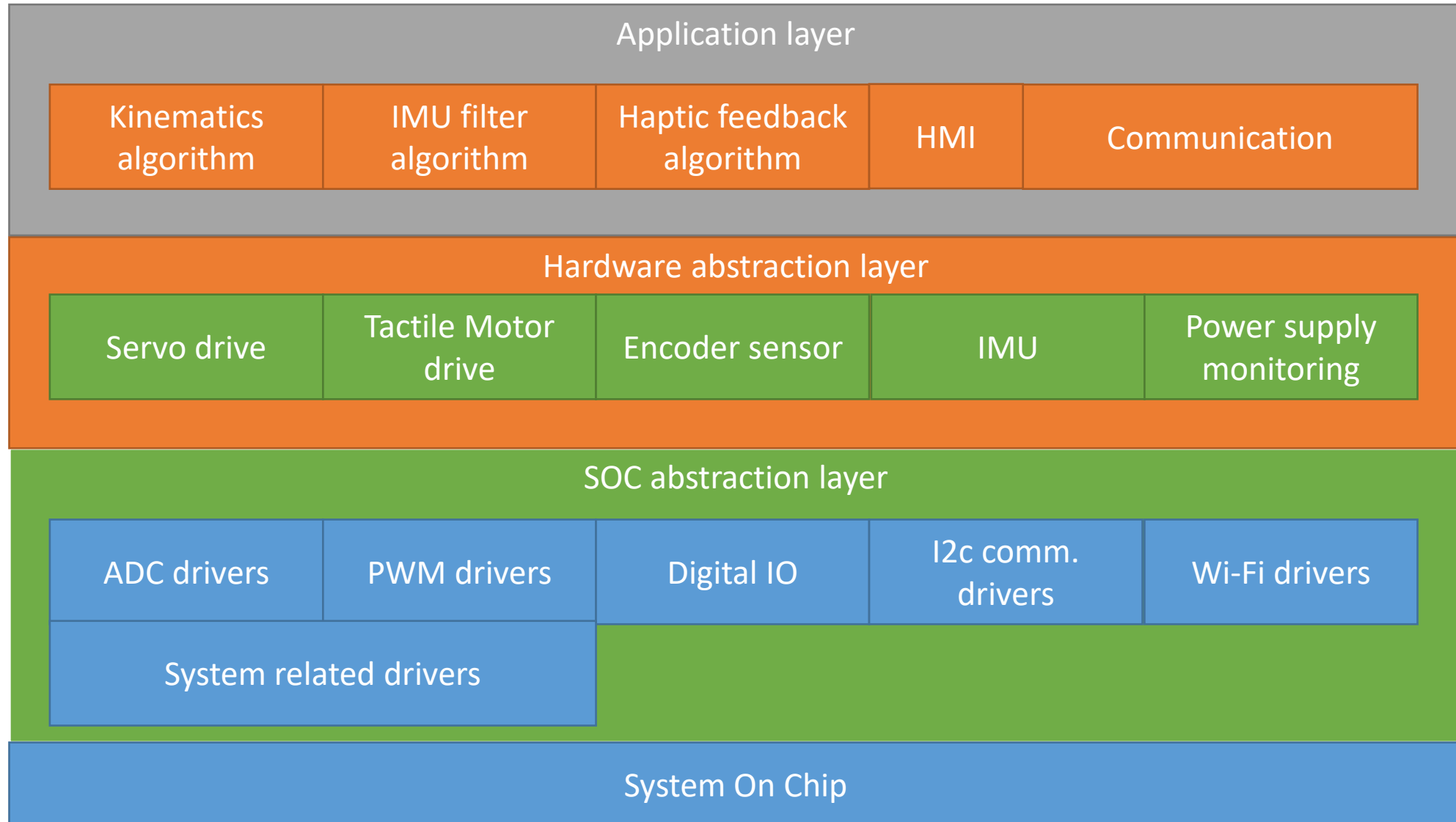- 3 DOF exoskeleton for each finger
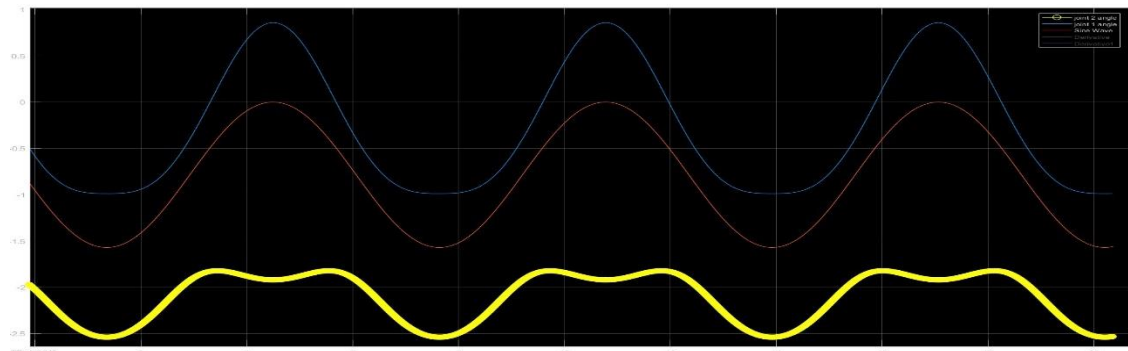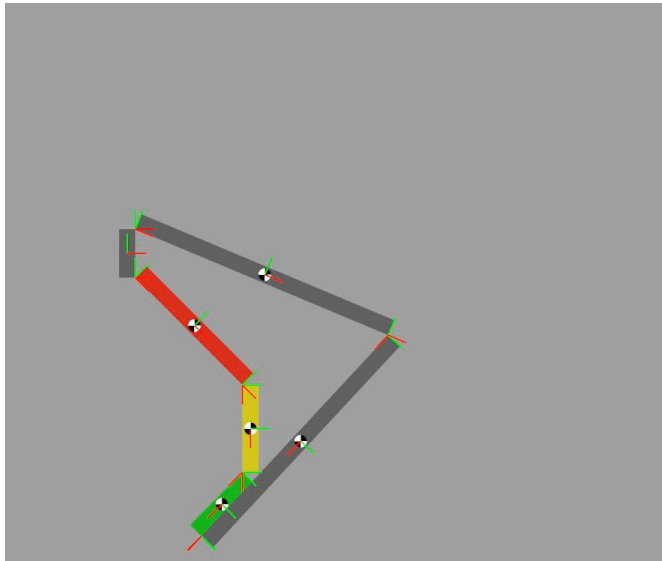
- Controllable Ratchet Mechanism for digital passive force feed back

Hardware architecture

Software Architecture

Small demo of active feedback