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# **Design av Robothand**

Presentation

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## 3 Styrhandsken

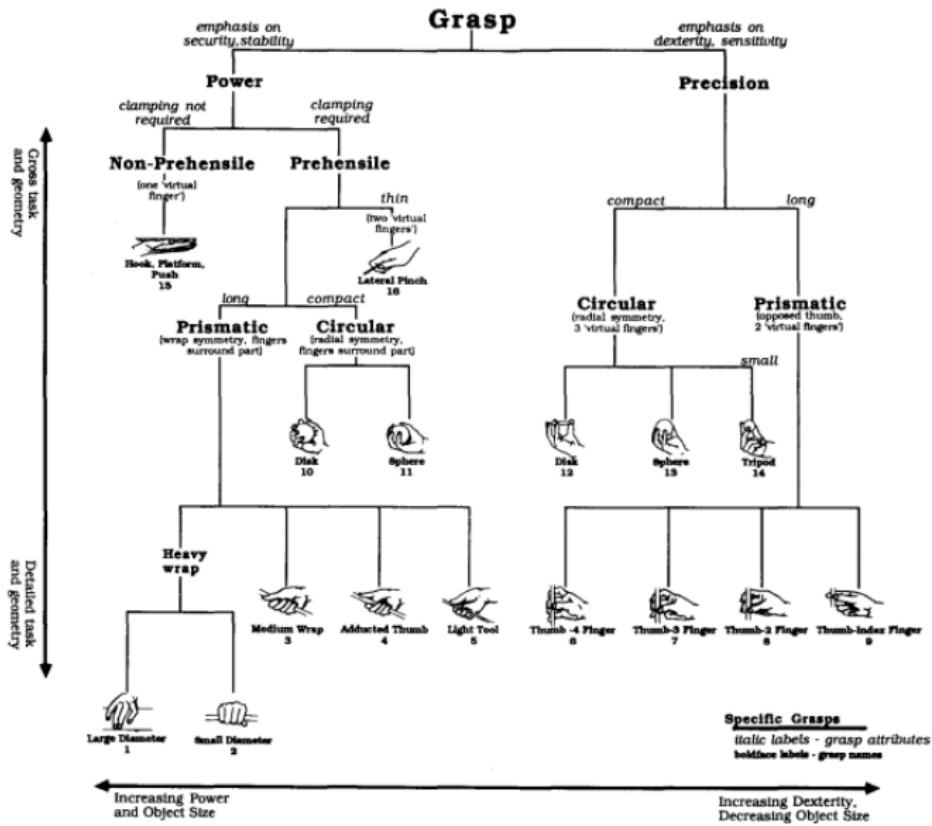
## 4 Signalbehandling

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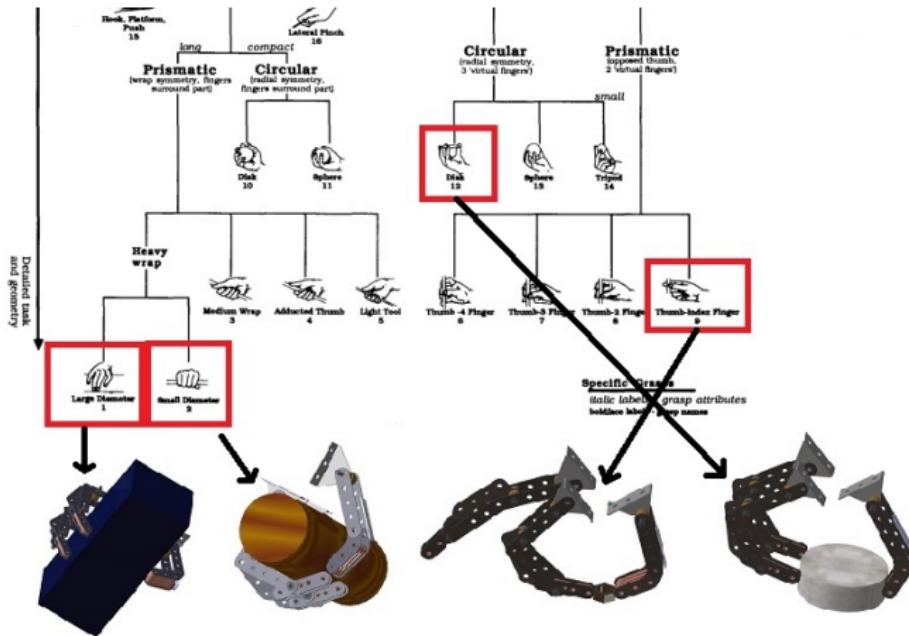
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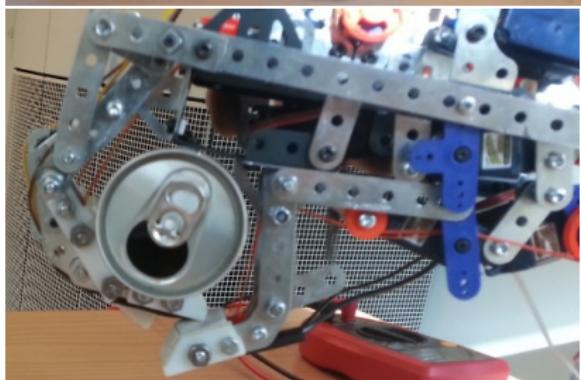
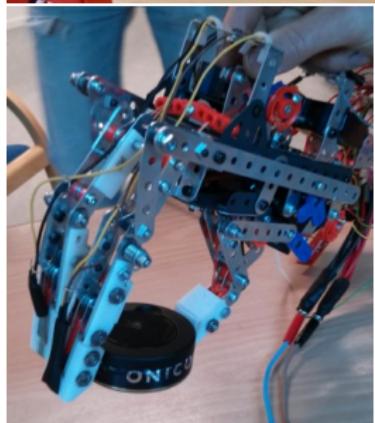
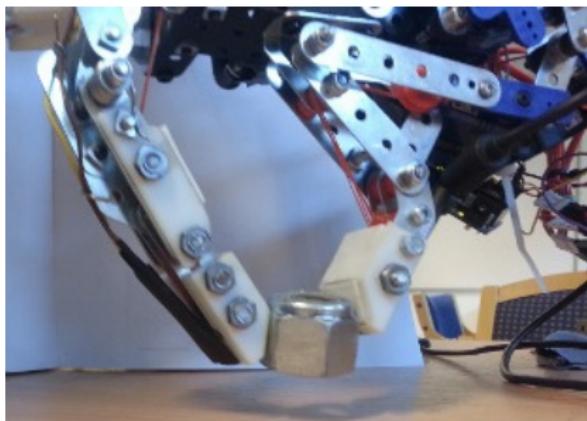
## 7 Reflektioner

# Cutkoskys handmodeller

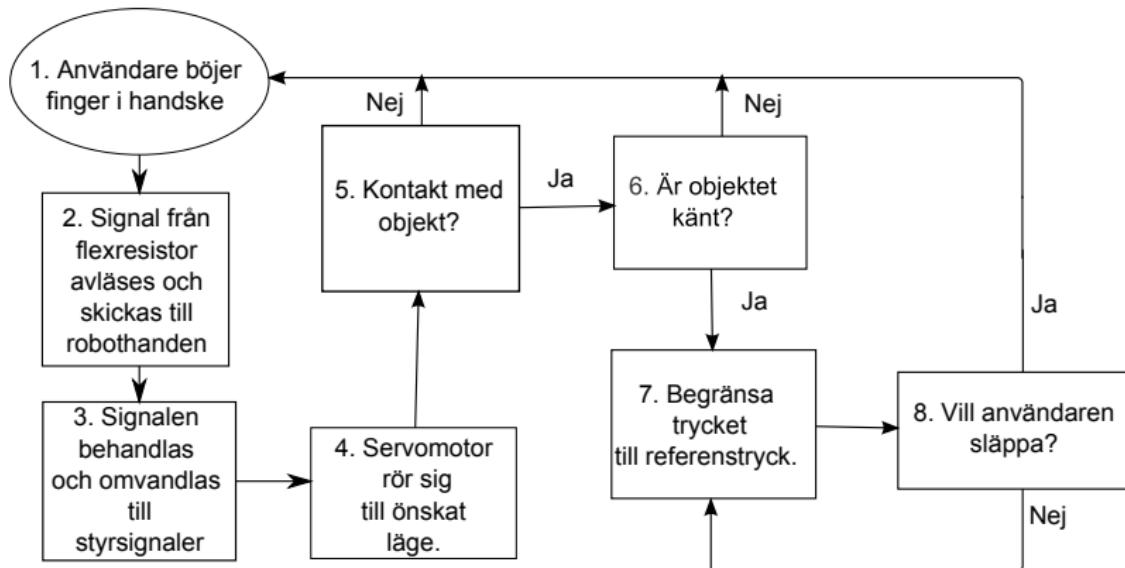


# Cutkoskys handmodeller

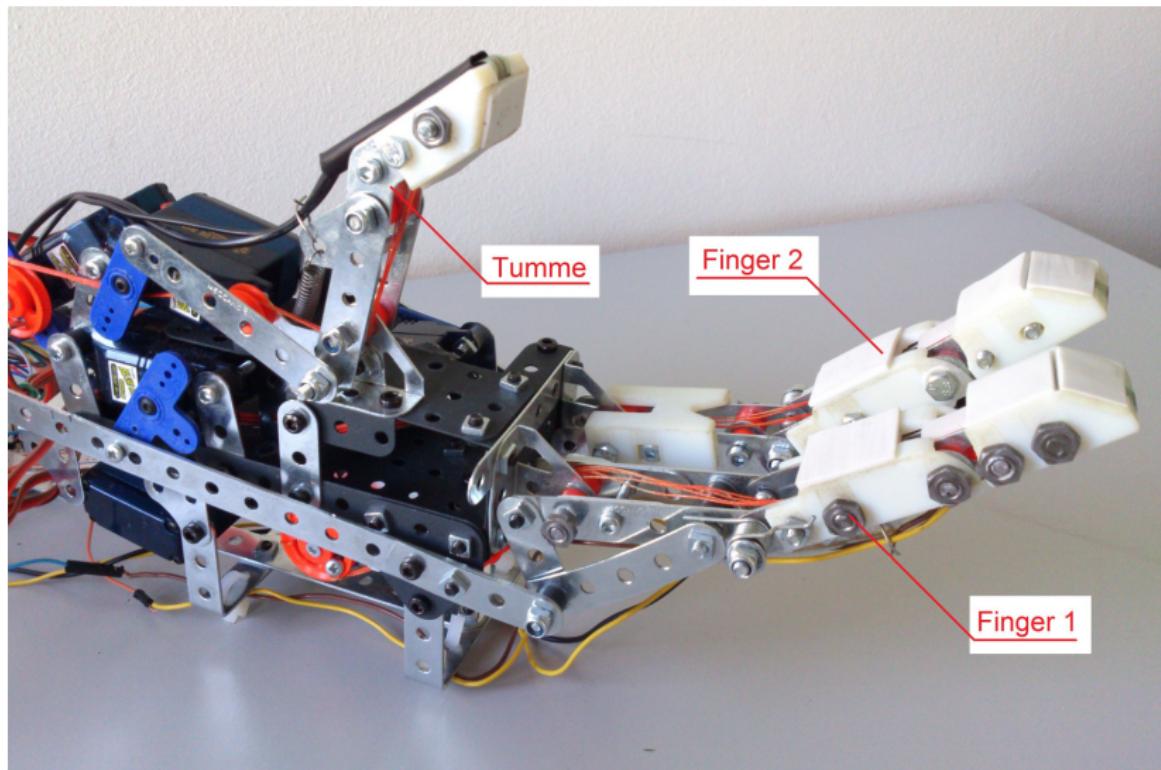




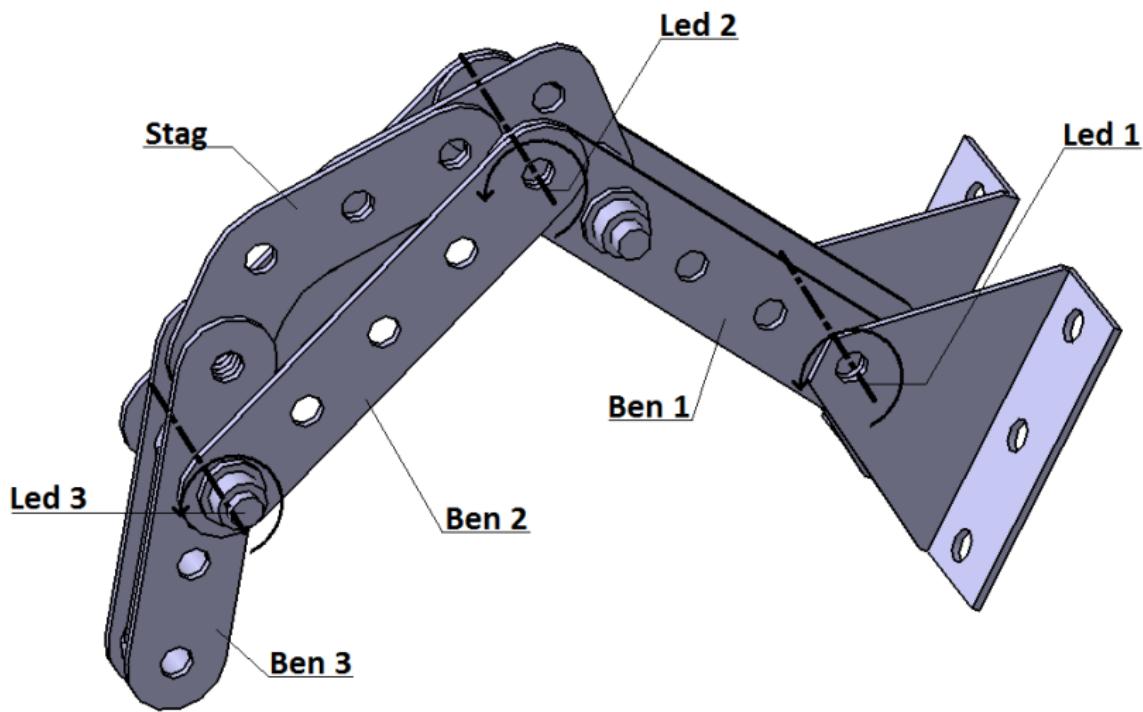
# Flödsschema



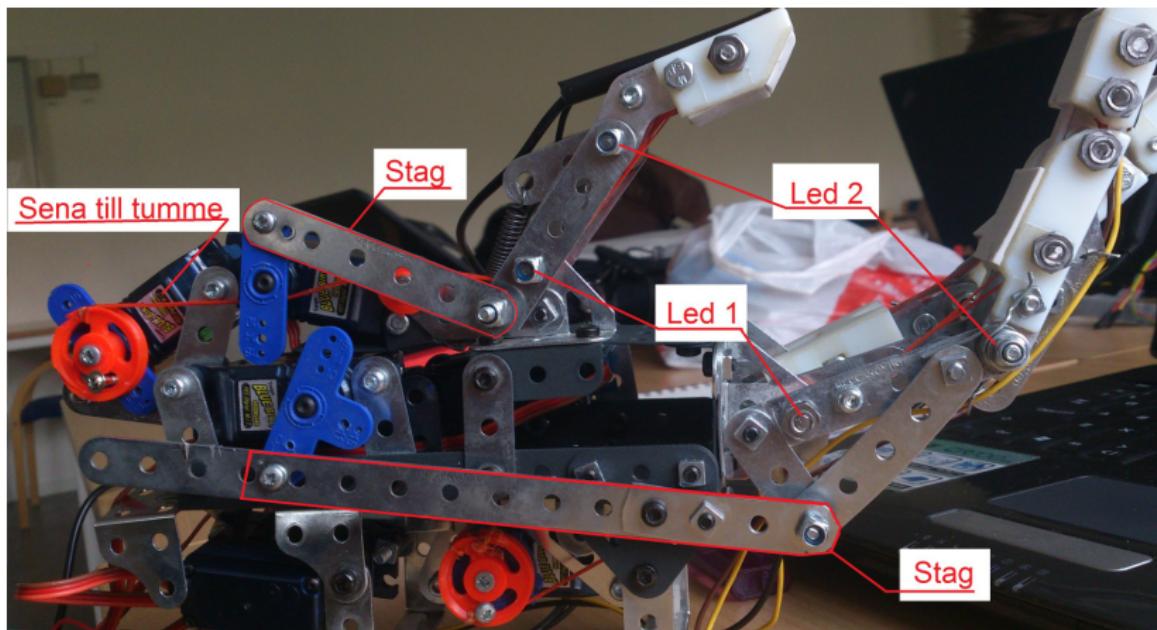
# Robothand



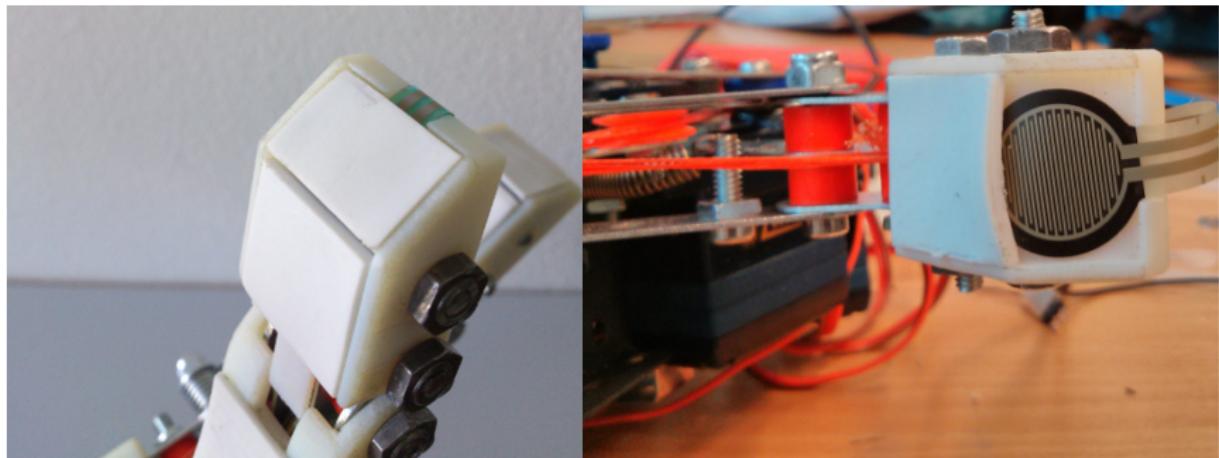
# Finger



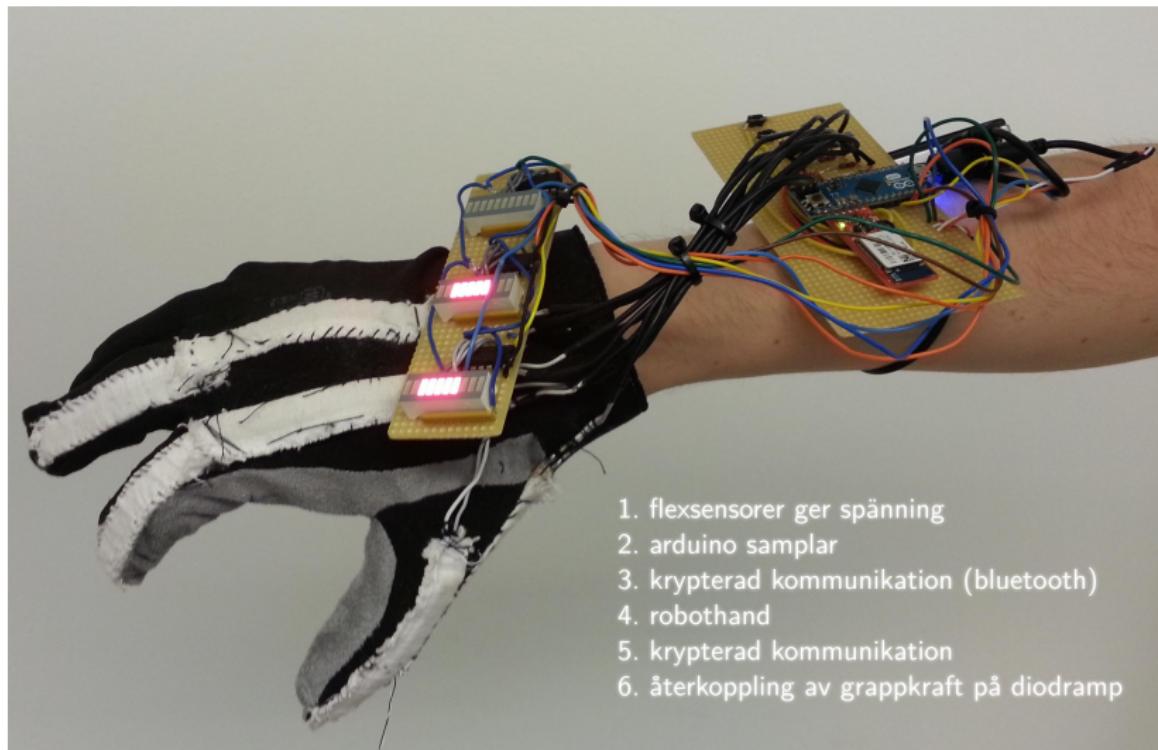
# Stag och sena



# Fingertoppar



# Styrhandsken



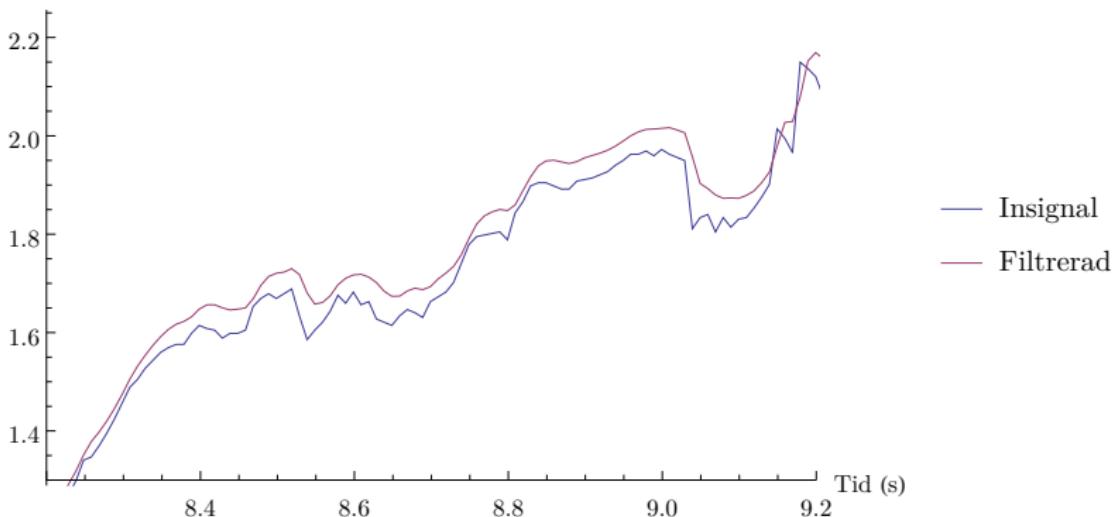
1. flexsensorer ger spänning
2. arduino samplar
3. krypterad kommunikation (bluetooth)
4. robothand
5. krypterad kommunikation
6. återkoppling av grappkraft på diodramp

# Signalens väg för robothanden

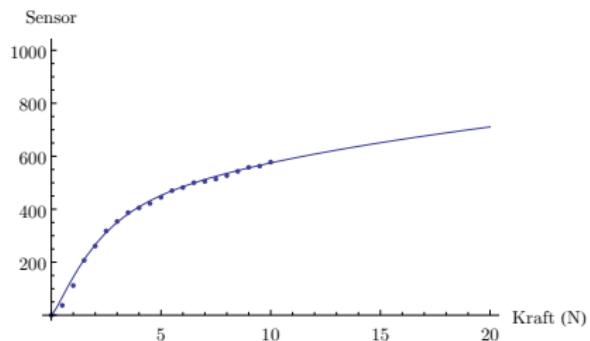
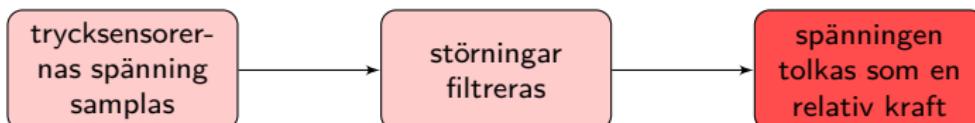




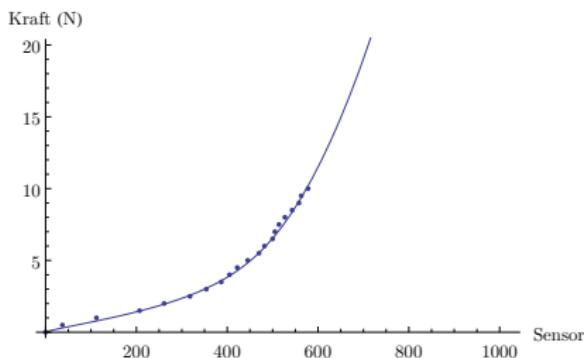
Spänning (V)



$$G(s) = \frac{\omega_0}{\omega_0 + s}, \omega_0 = 2\pi f_0 \Rightarrow y[n] = \frac{f_0(x[n] + x[n-1]) - y[n-1](f_0 - 2f_s)}{f_0 + 2f_s}$$

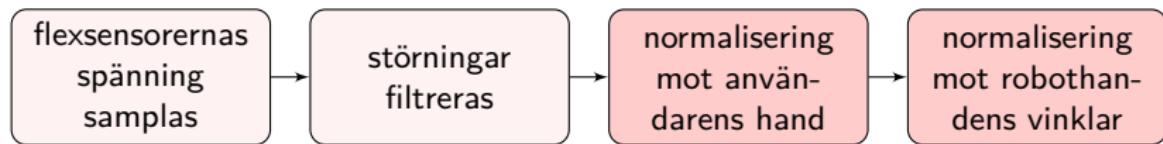


$$f(x) = a \left(1 - e^{-x/b}\right) x^d$$



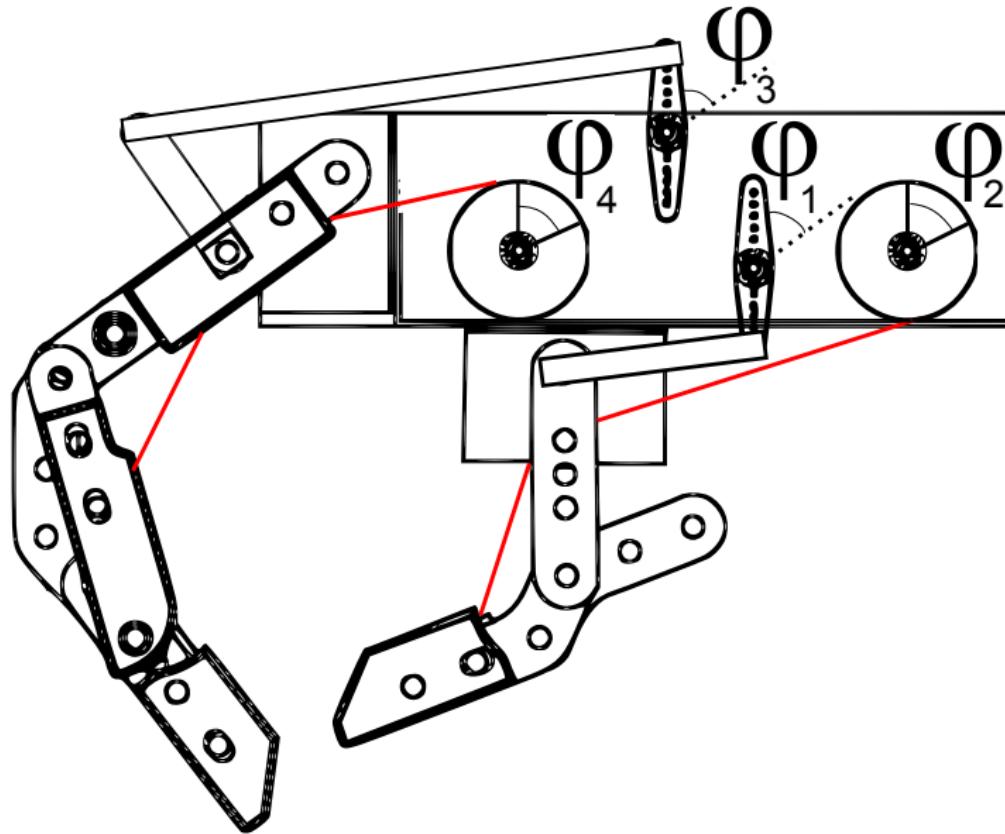
$$f^{-1}(x) = \text{interpolering}$$

# Signalens väg för styrhandsken



- De två första stegen som för robothanden

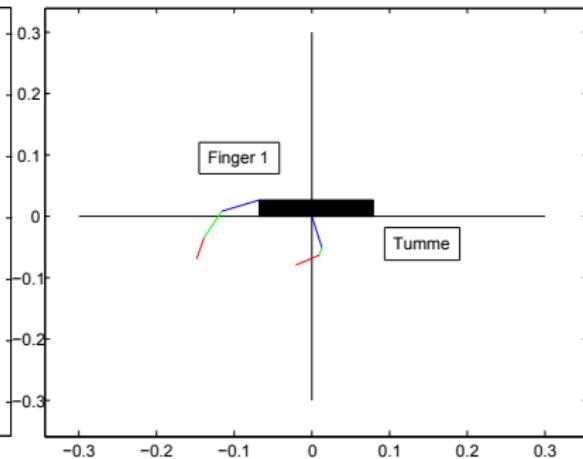
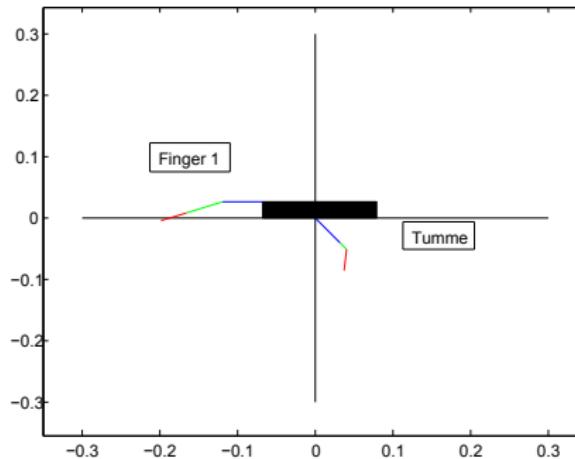
# Servovinklar



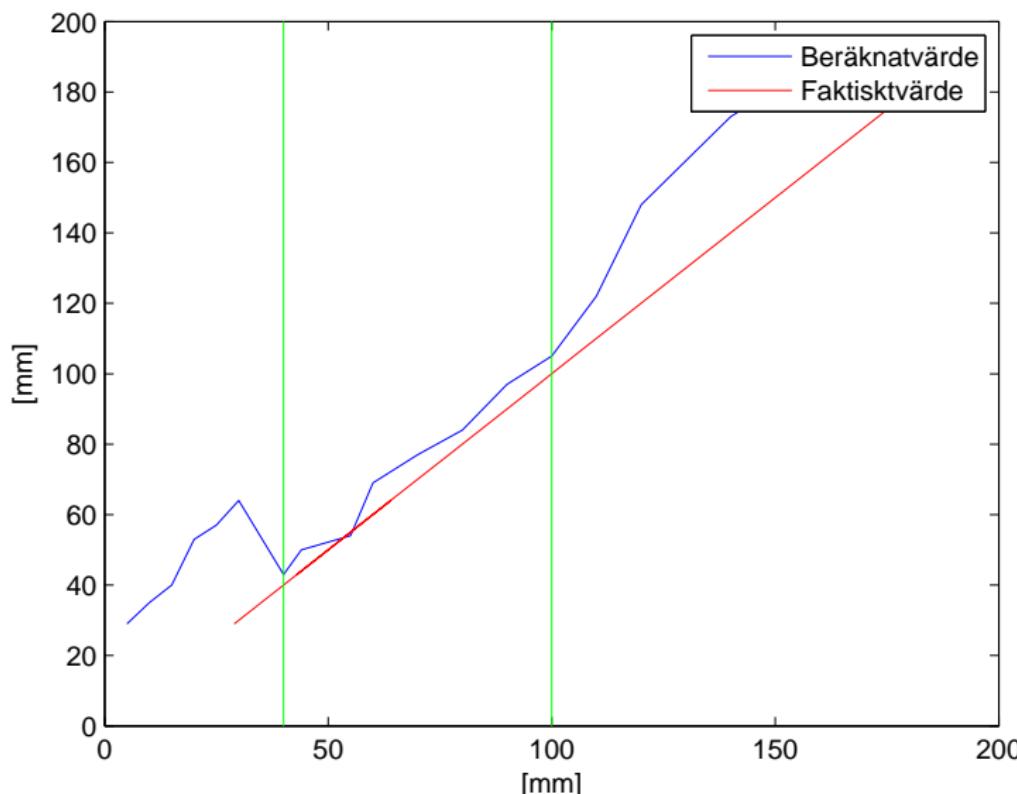
# Identifiering



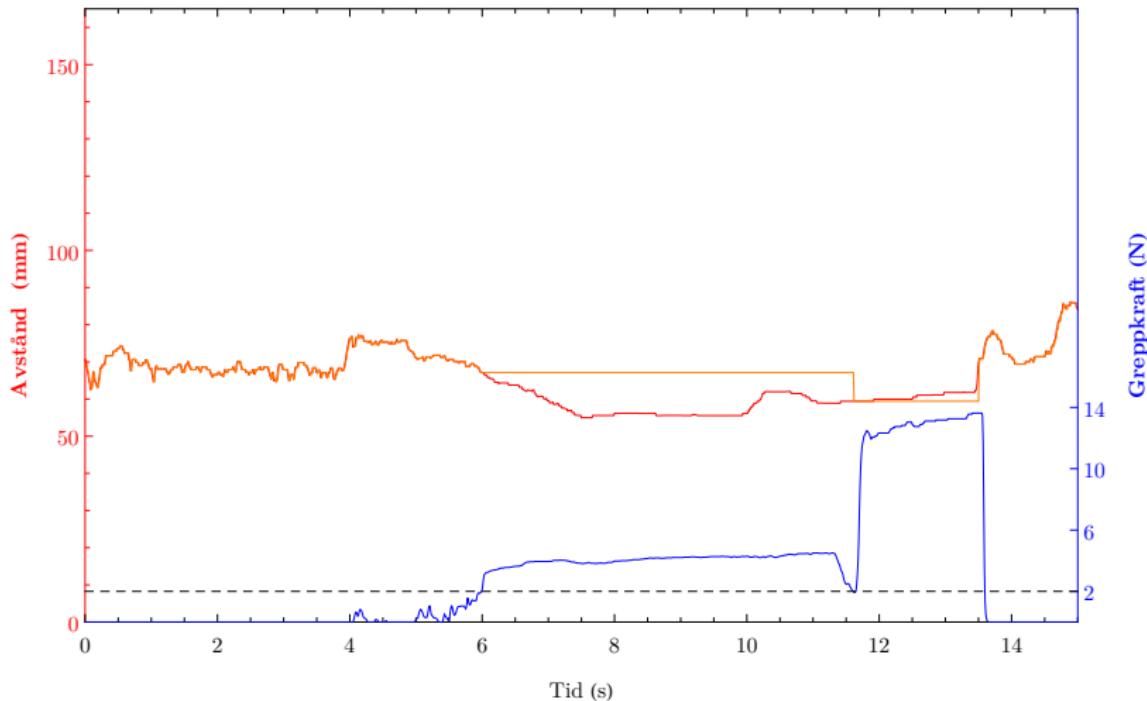
# Modell av handen



# Jämförelse mot verkliga värden



# Tryckbegränsning



# Reflektioner

## Bra

- Intuitiv styrning
- Användarvänlig
- Klarar av flera grepp
- Kraftåterkoppling

## Kan förbättras

- Meccano
- Återkoppling av vinklar
- Vikten av bra sensorer
- Latenstider (bluetooth inte optimalt)