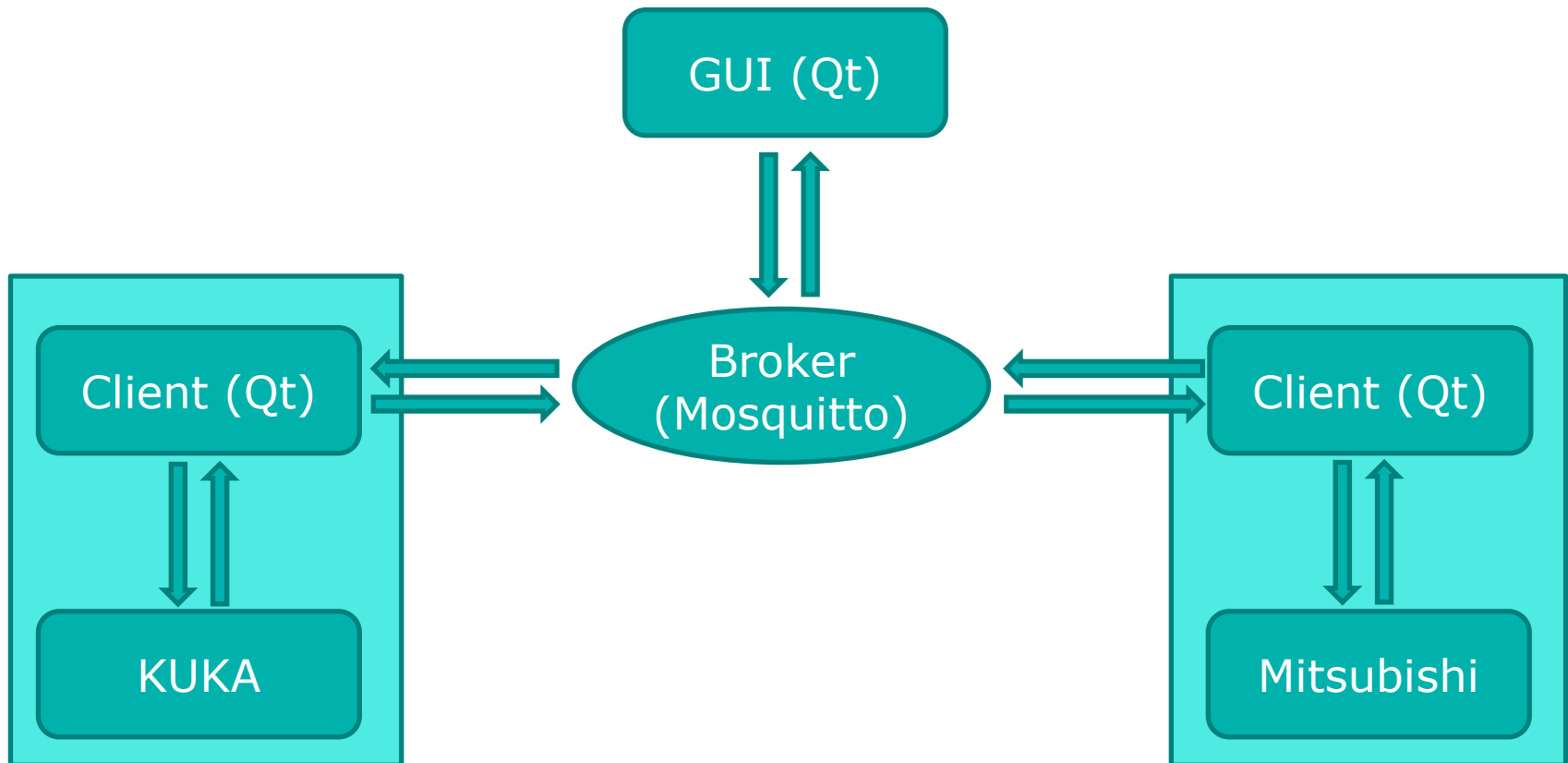


# Interdisziplinäres Projekt

## Roboter-Roboter Kommunikation

# Roboter-Roboter Kommunikation

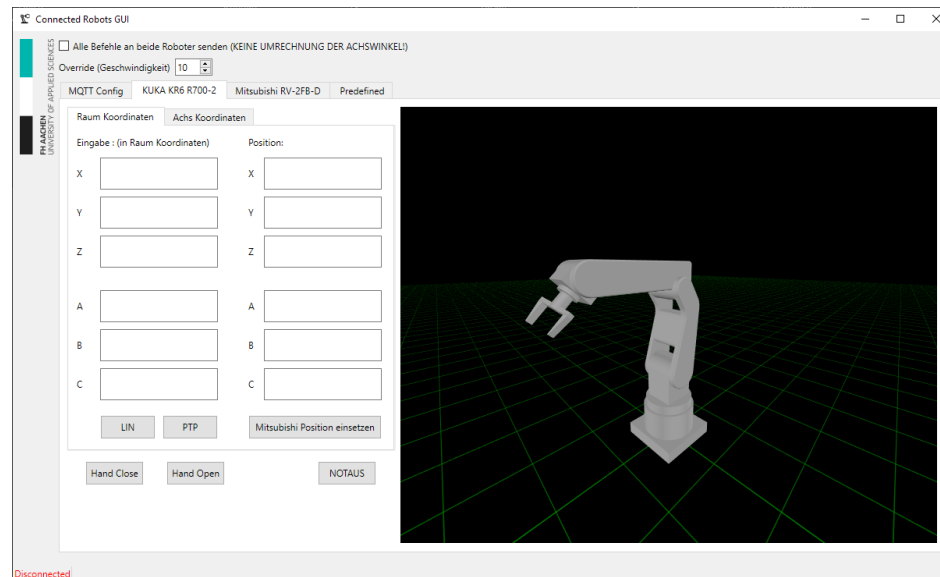
## Architektur



# GUI

## Prinzip

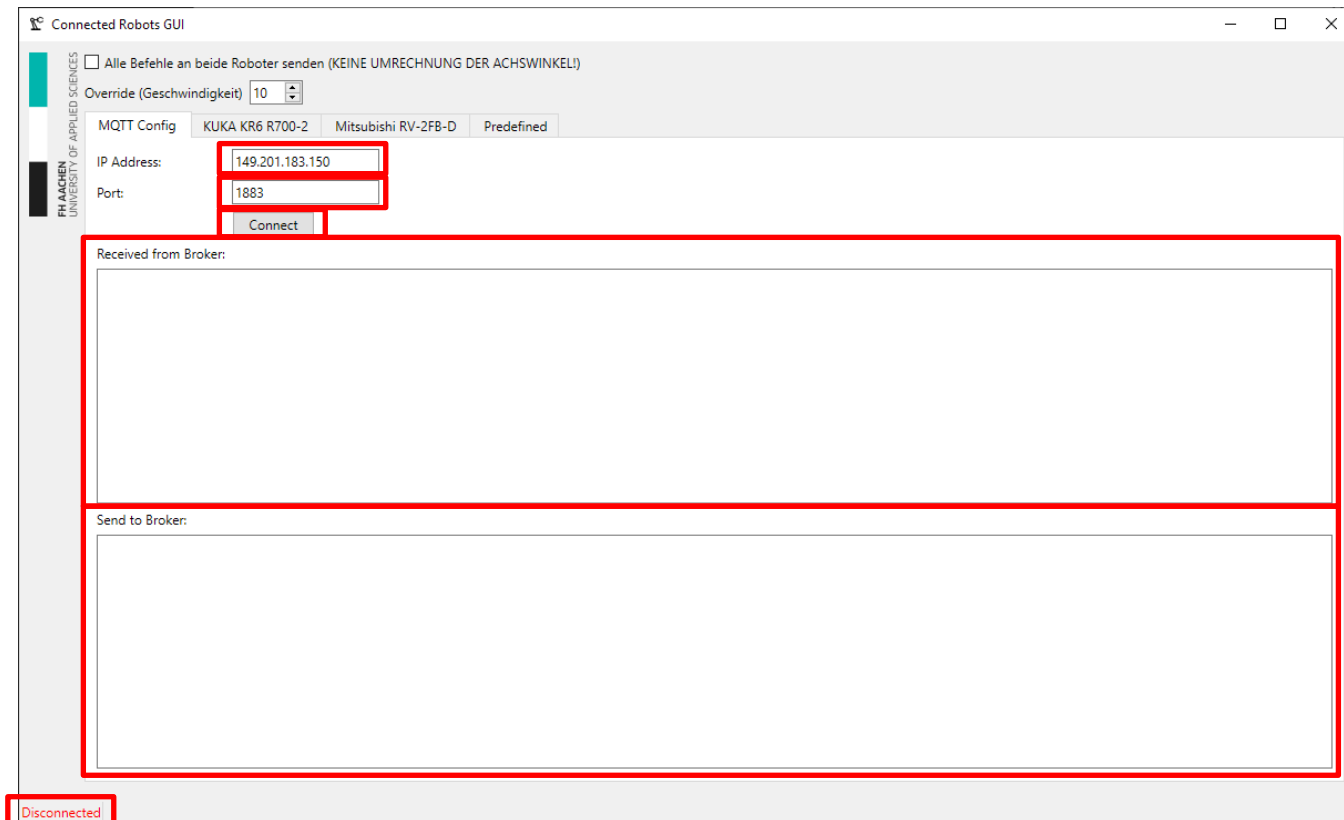
- Datenaustausch mit MQTT Broker
- Grafische Benutzeroberfläche
  - Roboter steuern
  - Roboter-Daten anzeigen
- 3D-Darstellung der aktuellen Roboterpose



# GUI

## Verbindung zu Broker

- IP: 149.201.183.150
- Port: 1883



# GUI

## Punkt vorgeben

- Kartesisch

Connected Robots GUI

☐ Alle Befehle an beide Roboter senden (KEINE UMRECHNUNG DER ACHSWINKEL)

Override (Geschwindigkeit) 10

MQTT Config KUKA KR6 R700-2 Mitsubishi RV-2FB-D Predefined

Raum Koordinaten Achs Koordinaten

Eingabe : (in Raum Koordinaten)

|   |                      |           |   |                      |
|---|----------------------|-----------|---|----------------------|
| X | <input type="text"/> | Position: | X | <input type="text"/> |
| Y | <input type="text"/> |           | Y | <input type="text"/> |
| Z | <input type="text"/> |           | Z | <input type="text"/> |
| A | <input type="text"/> |           | A | <input type="text"/> |
| B | <input type="text"/> |           | B | <input type="text"/> |
| C | <input type="text"/> |           | C | <input type="text"/> |

LIN PTP Mitsubishi Position einsetzen

Hand Close Hand Open NOTAUS

Disconnected

# GUI

## Achswinkel vorgeben

### Umrechnung der Winkel vom Kuka-Roboter

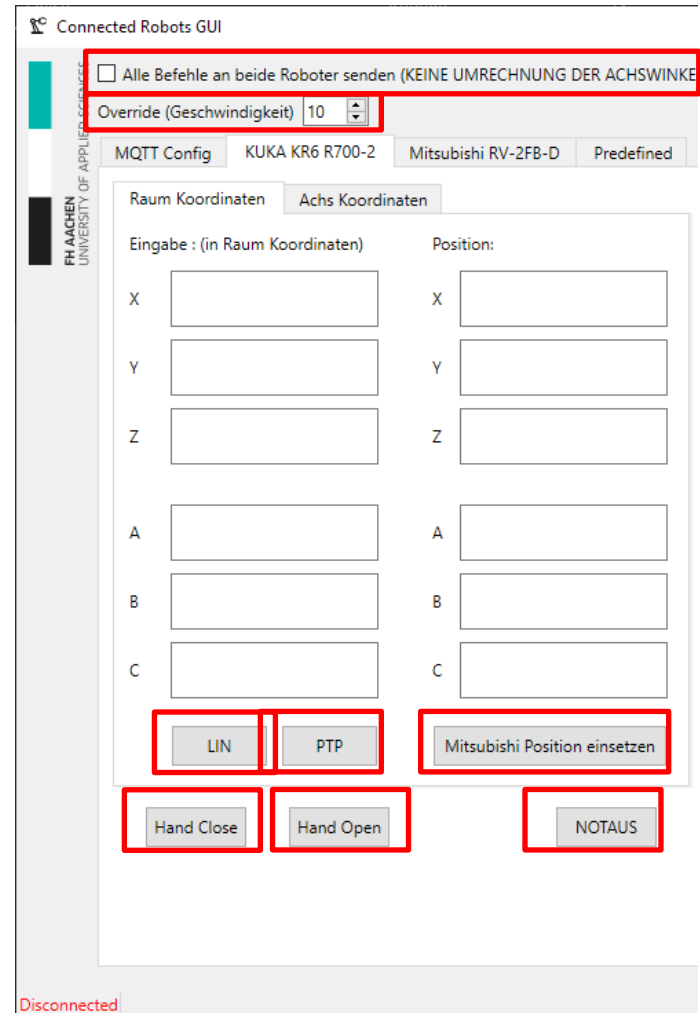
- Mitsubishi:
  - $A1 = 0^\circ$
  - $A2 = 0^\circ$
- Kuka:
  - $A1 = 30^\circ$
  - $A2 = -90^\circ$
- A3 bis A6 gleich definiert
- Umrechnung nur in GUI zur besseren Darstellung

The screenshot shows the 'Connected Robots GUI' interface. At the top, there's a status bar with 'Connected Robots GUI' and a 'Disconnected' indicator at the bottom left. Below the status bar, there's a navigation menu with 'MQTT Config', 'KUKA KR6 R700-2', 'Mitsubishi RV-2FB-D', and 'Predefined'. The 'KUKA KR6 R700-2' tab is selected. In the main area, there's a checkbox 'Alle Befehle an beide Roboter senden (KEINE UMRECHNUNG DER ACHSWINKEL)' and an 'Override (Geschwindigkeit)' dropdown set to '10'. The 'Achs Koordinaten' tab is active, showing two columns of input fields for axes A1 through A6. The left column is labeled 'Eingabe : (in AchsKoordinaten)' and the right column is labeled 'Position:'. A red rectangle highlights the input fields for A1, A2, A3, A4, A5, and A6 in the left column. Below the input fields, there are buttons for 'LIN', 'PTP', 'Mitsubishi Achswerte einsetzen', 'Hand Close', 'Hand Open', and 'NOTAUS'.

# GUI

## Funktionen

- Befehle
  - LIN
  - PTP
  - Hand Close
  - Hand Open
- „Not Aus“
  - (Nicht normgerecht)
- Werte des anderen Roboters verwenden
- Befehle an beide Roboter senden
- Override einstellen



# Client

## Prinzip

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- Schnittstelle zwischen MQTT Broker und Roboter
- Übersetzt und leitet Befehle an Roboter weiter
  - LIN, PTP, Hand ansteuern, usw.
- Leitet Roboterstatus an MQTT Broker weiter
  - Momentane Position
  - Momentane Achswinkel



# Client

## Funktionsweise

1. Config File öffnen
  2. Roboter verbinden
  3. MQTT Broker verbinden
  4. Kopplung aktivieren
- Datenaustausch Roboter
  - Datenaustausch MQTT Broker

The screenshot shows the 'Connected Robots Client' window. It features a 'Select Config File' button (highlighted with a red box) and a 'Configuration File' field showing 'None'. A 'Debug/Test' button is in the top right. Below this is the 'Robot' section, which includes 'IP Address' (172.31.1.146) and 'Port' (10003) fields, a 'Connect' button (highlighted with a red box), and a 'Status' field showing 'Disconnected'. Under the 'Robot' section are two large text areas: 'Received from Robot:' and 'Send to Robot:'. A 'Home' button is located below these areas. In the center, there is a checkbox labeled 'Connect Robot to MQTT' (highlighted with a red box). Below this is the 'MQTT' section, with 'IP Address' (127.0.0.1) and 'Port' (1883) fields, a 'Connect' button (highlighted with a red box), and a 'Status' field showing 'Disconnected'. At the bottom are two more large text areas: 'Received from Broker:' and 'Send to Broker:'. The entire interface is enclosed in a window frame with standard OS controls.