# Weekly Presentation

## Week 40

Luleå University of Technology

September 28, 2020

# Group members

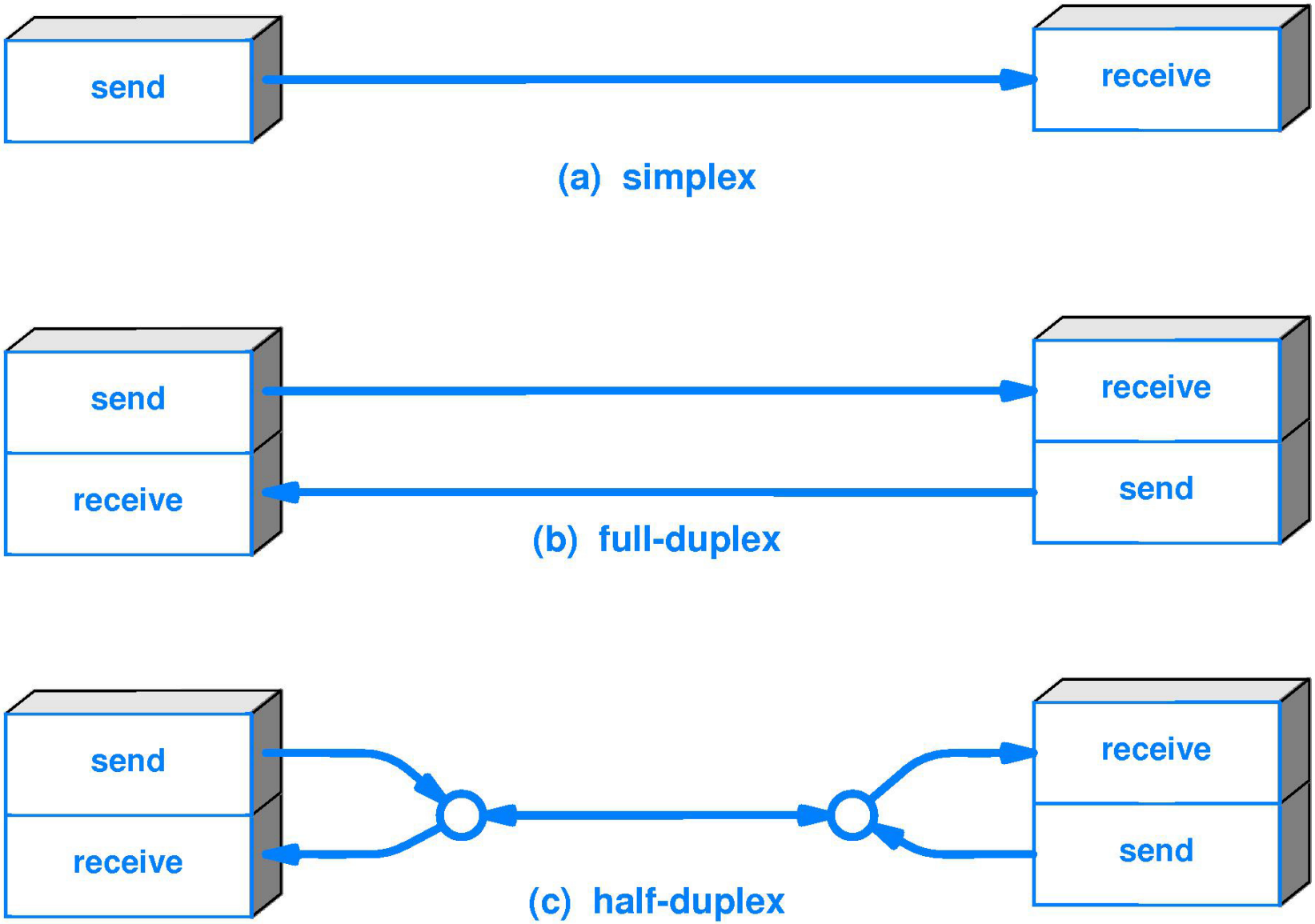
- Y-students
  - Martin Blaszczyk - Project leader and object detection
  - Edward Cedergård -Arm and gripping tool
  - Niklad Dahlqvist - Arm and gripping tool
  - Måns Norell - Movable base
- D-students
  - Edward Källstedt - Object detection
  - Albin Martinsson - Arrowhead and Git

# Overview

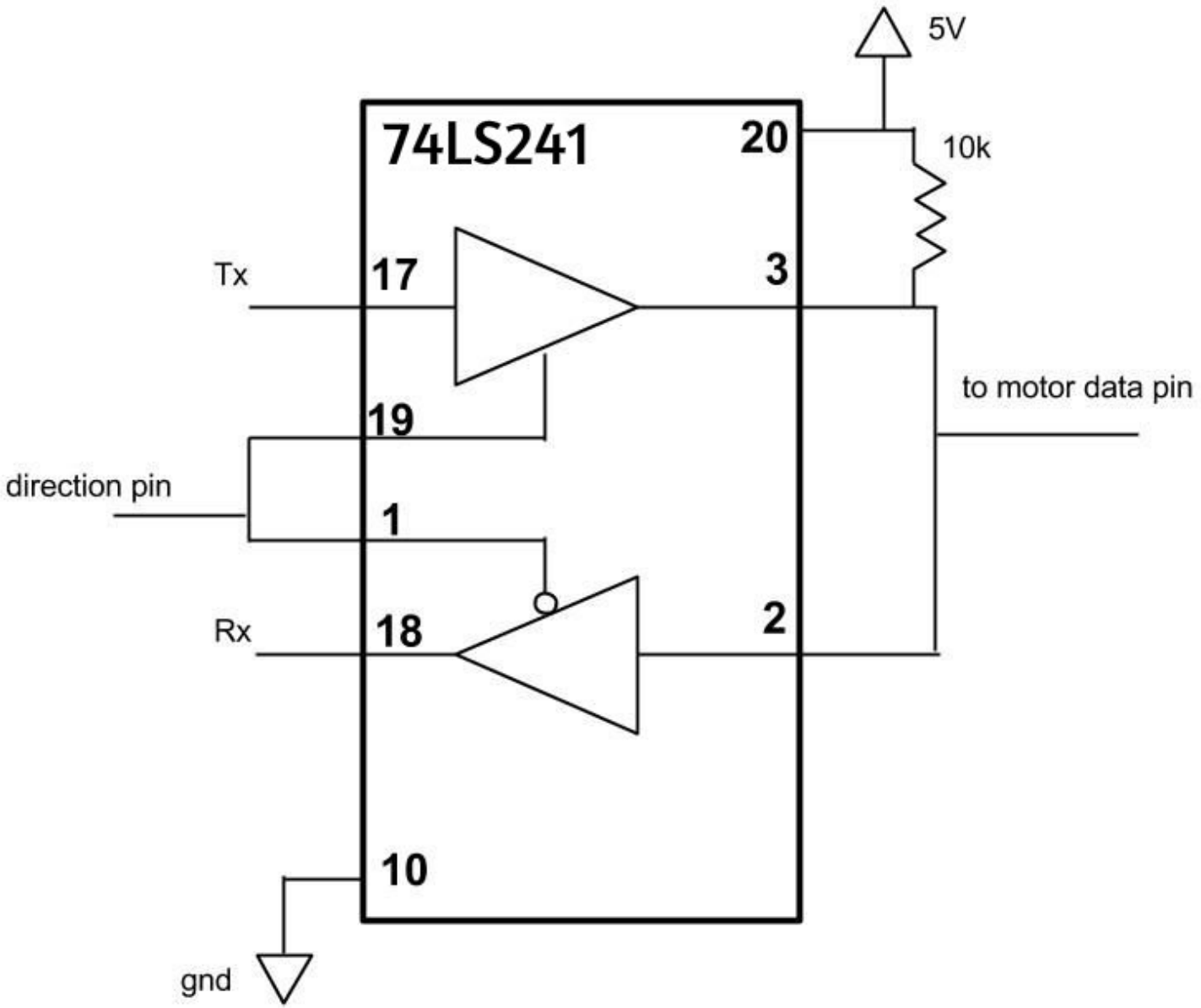
What we have done and what we are working on:

- Duplex to simplex
- Serial communication
- Dynamixel data packages
- Arm construction

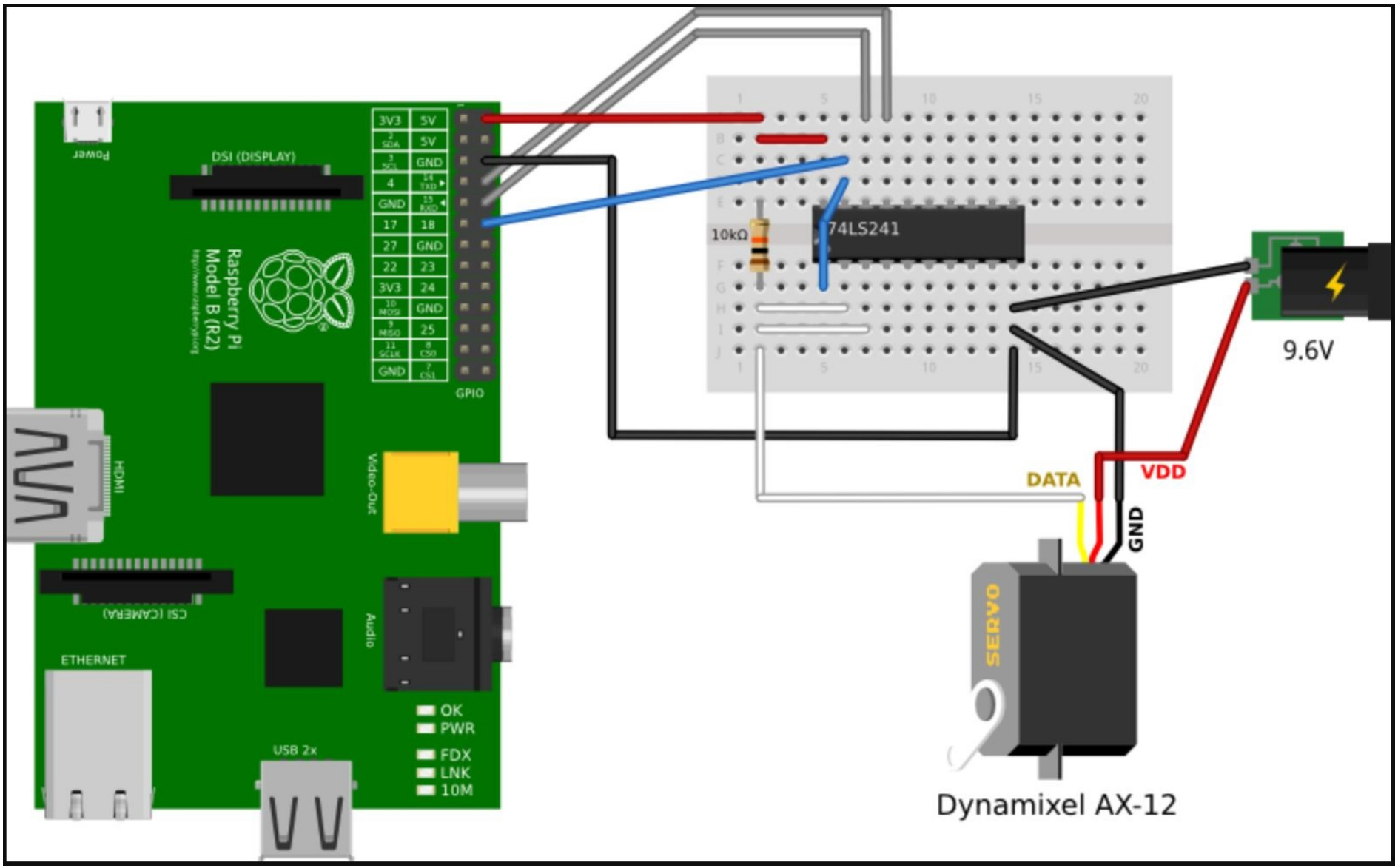
# Full-duplex to half-duplex



# Dynamixel communication



# Curcuit


DSI (DISPLAY)
Raspberry Pi
Model B (R2)
GPIO
HDMI
Video-Out
CSI (CAMERA)
Audio
ETHERNET
USB 2x
OK
PWR
FDX
LNK
10M
10kΩ
74LS241
9.6V
DATA
VDD
GND
SERVO
Dynamixel AX-12

# Serial communication

- Logic analyzer

# Dynamixel data packages

- Data packets structure
- Timing of response
- Example package

# Dynamixel data packages

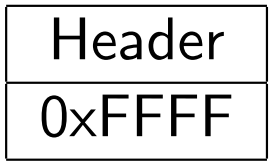
Instruction package - send to the motor

| Header | ID | Length | Instruction | Param 1 | ... | Param n | Checksum |
|---|---|---|---|---|---|---|---|
| 0xFFFF | ID | Length | Instruction | param 1 | ... | Param n | Checksum |

Status return package - recieve from the motor

| Header | ID | Length | Error | Param 1 | ... | Param n | Checksum |
|---|---|---|---|---|---|---|---|
| 0xFFFF | ID | Length | Error | Param 1 | ... | Param n | Checksum |

# Instruction package



# Instruction package

| Header | ID | Length |
|---|---|---|
| 0xFFFF | ID | Length |

# Instruction package

| Header | ID | Length | Instruction | Param 1 | ... | Param n |
|---|---|---|---|---|---|---|
| 0xFFFF | ID | Length | Instruction | param 1 | ... | Param n |

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# Status return package

| Header | ID | Length | Error | Param 1 | ... | Param n | Checksum |
|---|---|---|---|---|---|---|---|
| 0xFFFF | ID | Length | Error | Param 1 | ... | Param n | Checksum |

# Timing of return package

- Return delay can be set for each motor
- Values between 0 - 254 s

# Arm construction

- Use the official plastic pieces

# Overall timetable

| Sep | Oct | Nov | Dec |
|---|---|---|---|
| Concept generation | Evaluation | Evaluation | |
| Theory | Prototyping | Evaluation | Finishing up |
| Simulation | Evaluation | Evaluation | |
| Prototyping | Final Design | Evaluation | |

# Time plan for September

| Subproject | Week 1 | Week 2 | Week 3 | Week 4 |
|---|---|---|---|---|
| Arrowhead | Reading | Setup | API | Prototyping |
| Movable base | Reading | Modeling | Simulation | Implementation |
| Arm and grip | Reading | Kinematics | Simulation | Prototyping |
| Object detection | Reading | Testing | Prototyping | Evaluation |

# Questions?