Midterm Presentation

AIMBOT

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Overview

1. Project structure
   - Team
   - Time plan
2. Engineering challenge
   - Concept
   - Requirements
   - Internals
   - Flowcharts
3. Machine Vision
   - EDWARD USE SUBSECTIONS!

Group members

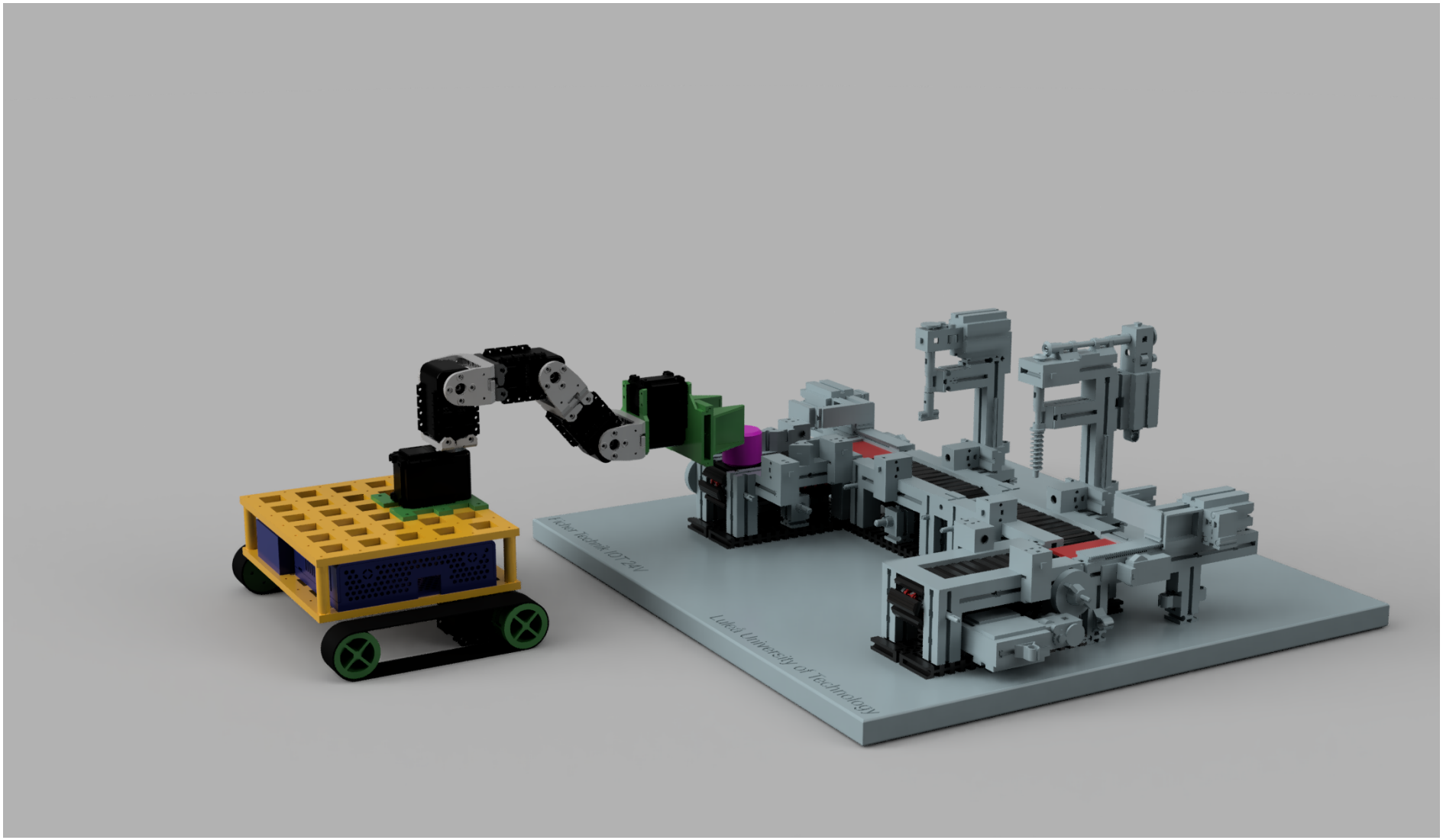
- Y-students
  - Martin Blaszczyk - Project leader and object detection
  - Edward Cedergård -Arm and gripping tool
  - Niklad Dahlqvist - Arm and gripping tool
  - Måns Norell - Movable base
- D-students
  - Edward Källstedt - Object detection
  - Albin Martinsson - Arrowhead and Git

Overall timetable

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

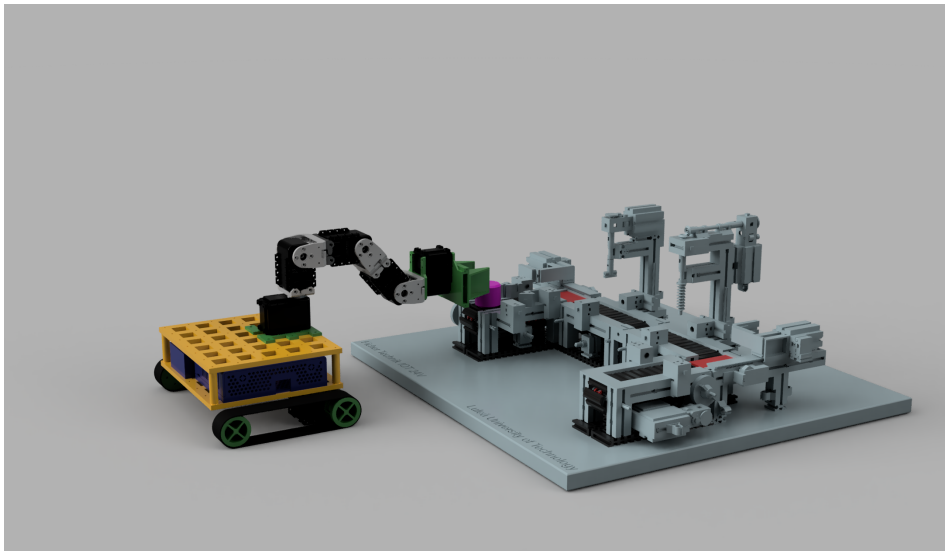
Engineering Challenge

Concept rendering (video)



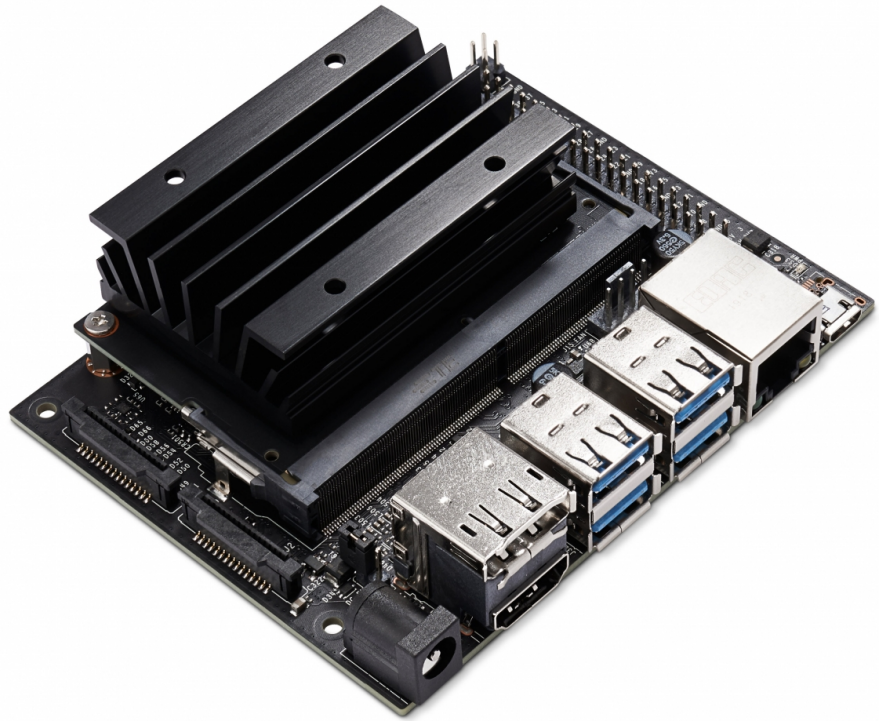
Requirements

- Navigate the factory floor
  - Movable base
  - Line following
  - QR-detection
  - Object detection (ToDo)
- Pick up the Object
  - Robot arm with smart Servos
- Arrowhead integration
  - Certificates
  - Instructions



NVIDIA Jetson Nano

- Runs Ubuntu
- Two camera ports (CSI)
- More powerful GPU than RPi



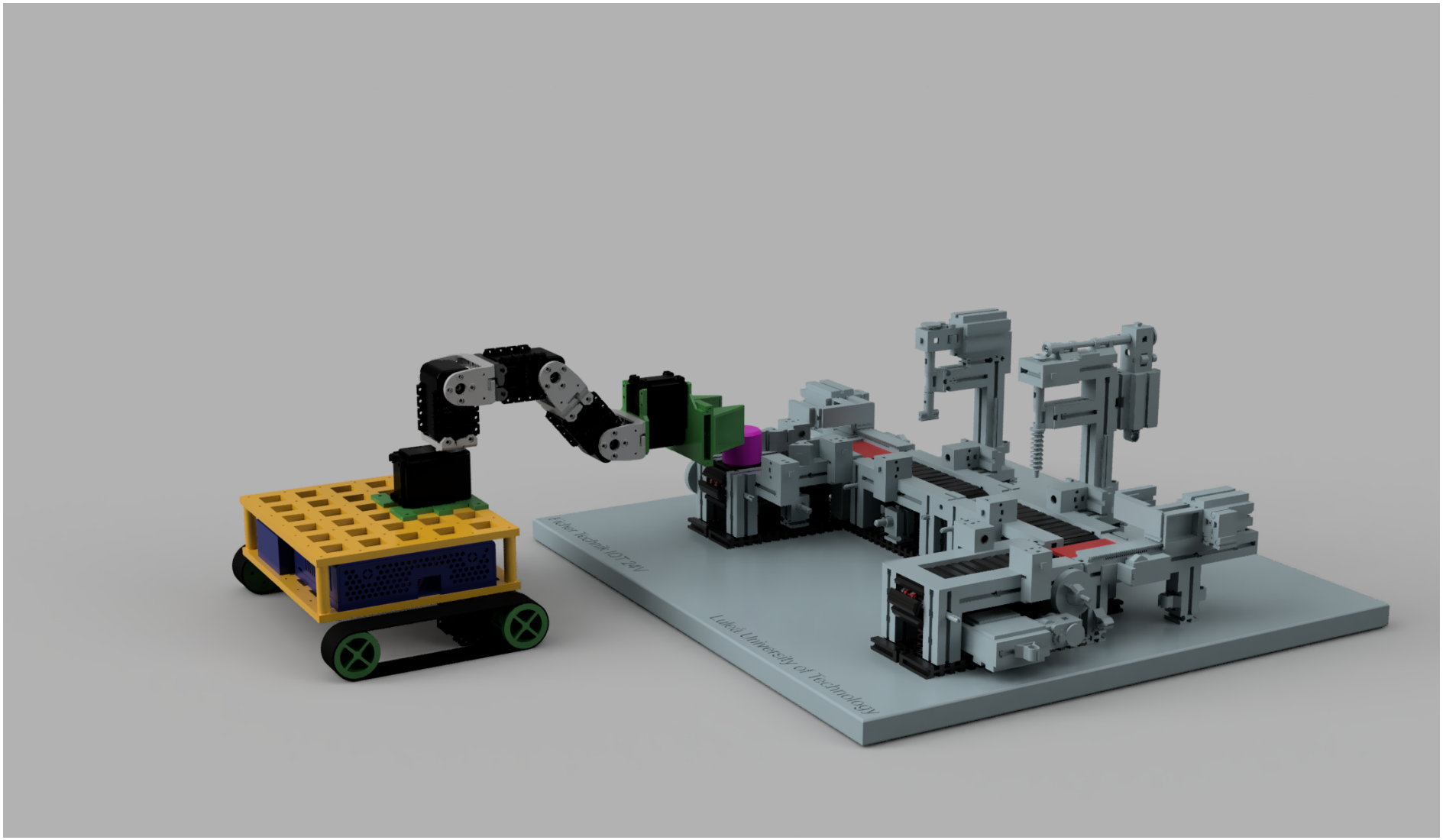
Cameras

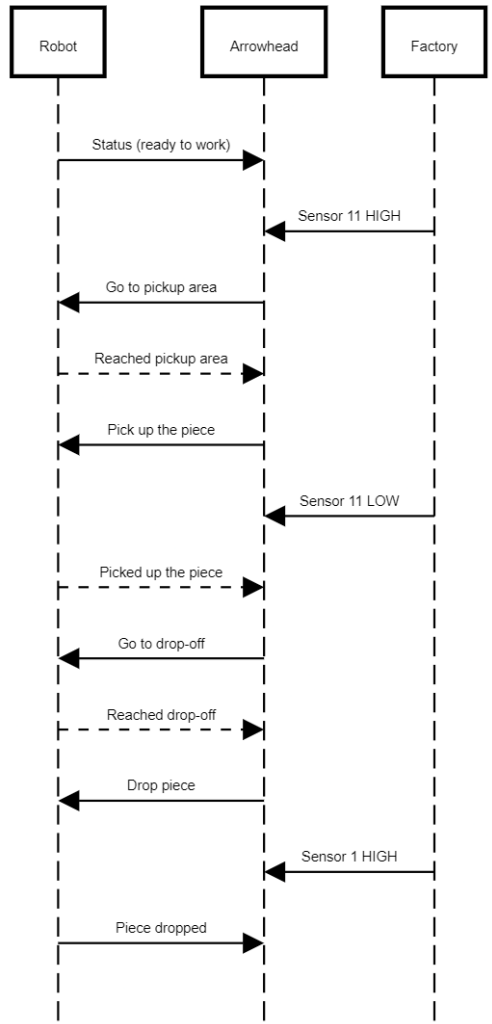
- Compatible with NVIDIA and RPi
- Small package
- 8 megapixels
- Video:
  - 1080p @ 30 fps
  - 720p @ 60fps

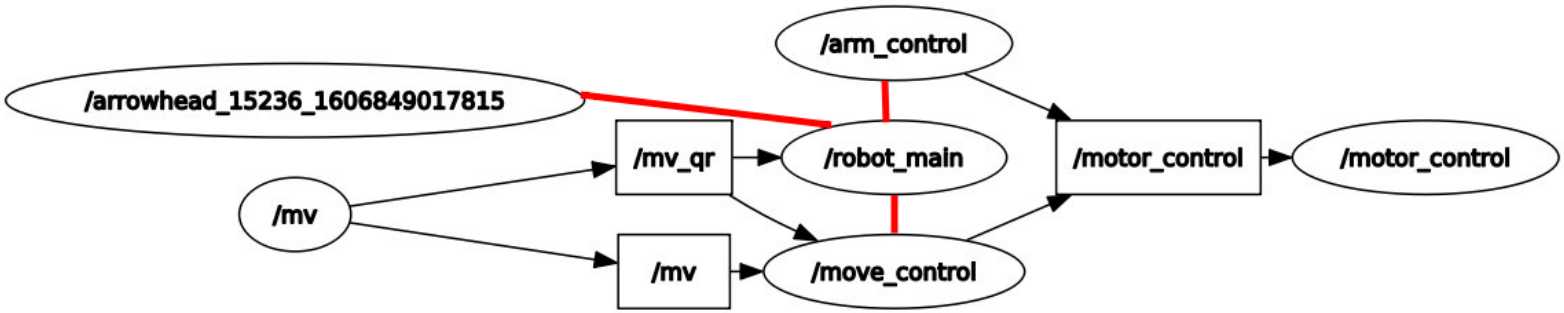
Dynamixel Smart Motors

- Connects in series
- Angle and wheel mode
- Feedback

Concept rendering




Robot
Arrowhead
Factory
Status (ready to work)
Sensor 11 HIGH
Go to pickup area
Reached pickup area
Pick up the piece
Sensor 11 LOW
Picked up the piece
Go to drop-off
Reached drop-off
Drop piece
Sensor 1 HIGH
Piece dropped



Services:

/move_control
- follow_line
- turn_left
- turn_right
- turn_back

/arm_control
- pickup
- place

Topics

Nodes

Questions?