Weekly Presentation

Week 38

Luleå University of Technology

September 15, 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

Robotic arm

What we have done and what we are working on:

- Servos
- Representation (DH-parameters)
- Kinematics
- Chosen arm, 4DOF
- 3D modeling

Servos

- Dynamixel
  - Feedback; position, torque, temperature, etc
  - Serial communication
  - Chainable

Figure: Dynamixel AX-12A servo.

Representation

- Denavit–Hartenberg parameters
- Joints
- Degrees of freedom

Link	a	alpha	d	theta
1	0	-90	d1	theta 1
2	a2	0	0	theta 2
3	a3	0	0	theta 3
4	a4	0	0	theta 4

Kinematics

- Forward kinematics
- Inverse kinematics
- Numerical or analytical solution
- Robotics Toolbox in Matlab by Peter Corke

Kinematics

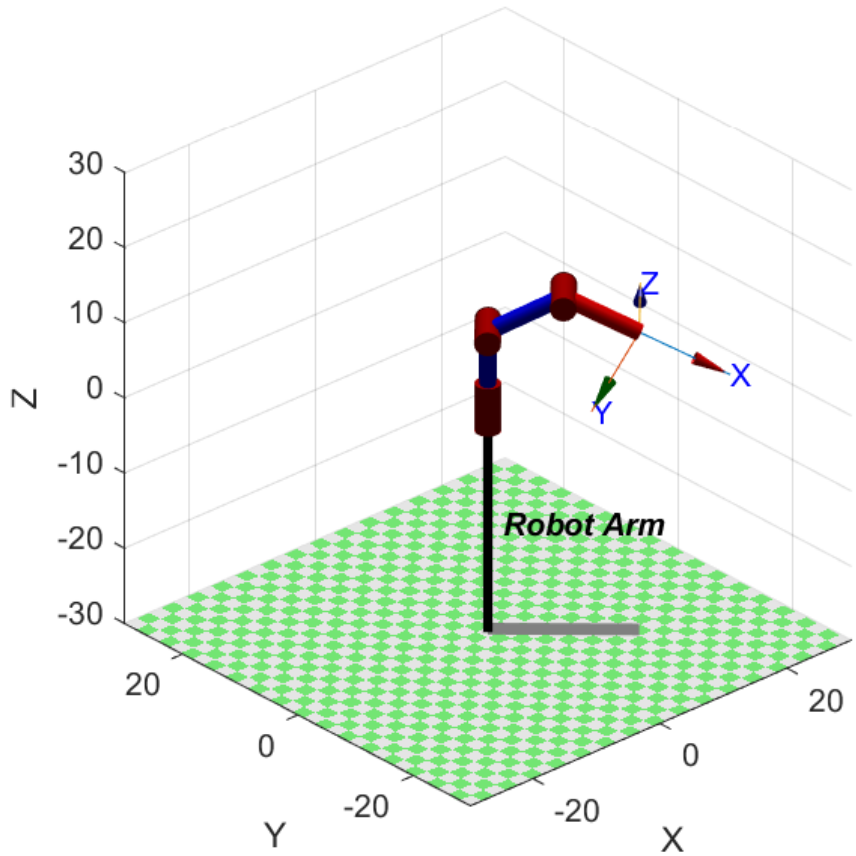

Figure: 3DOF robot moving in a triangle pattern.

Chosen arm

- Four degrees of freedom
- 3DOF for positioning and a "wrist" for controlling the angle of the end effector

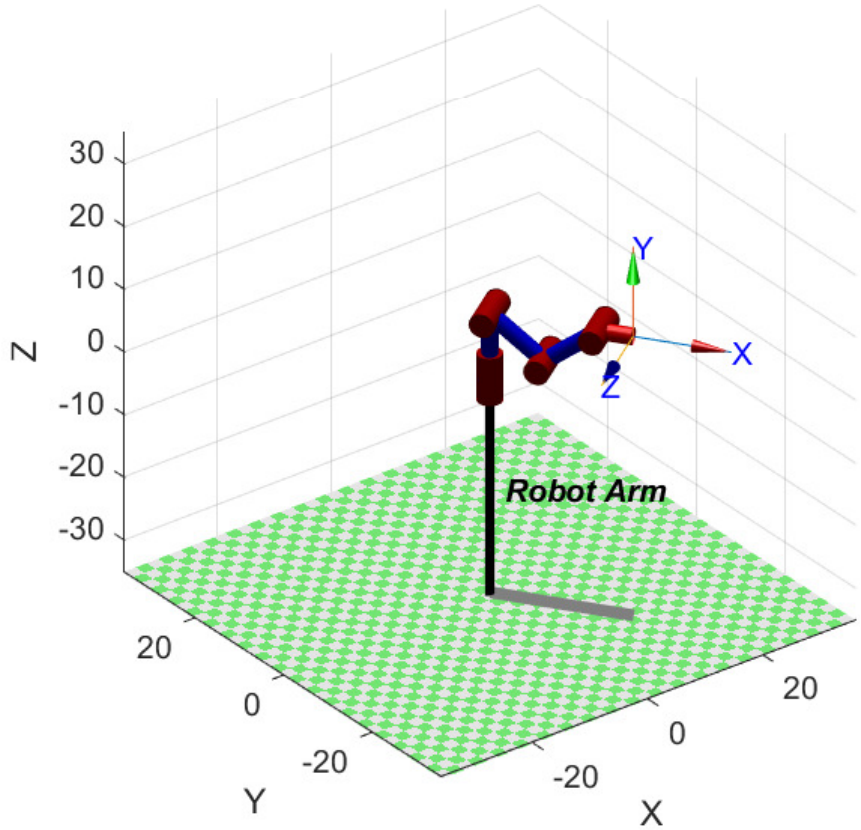

Figure: Representation of the robotic arm.

3D Modeling

- Modeling in fusion 360
- Work in progress
- Time table

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?