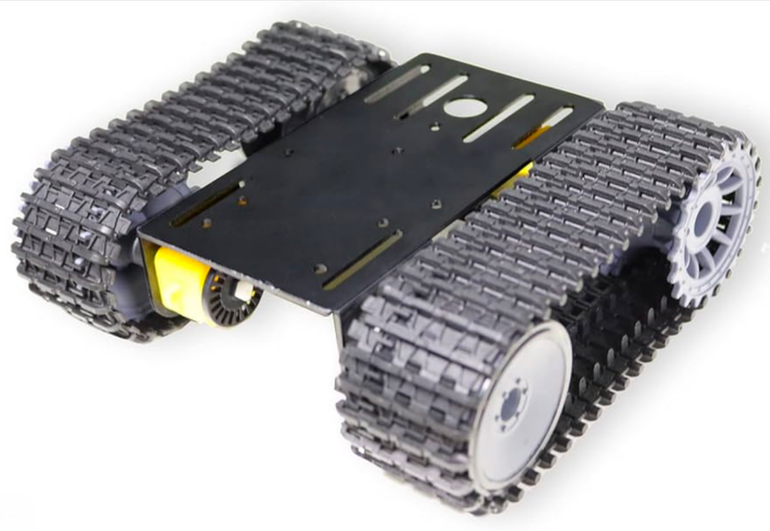
UNIVERSITY OF TARTU

JULIAN RENE LECLERC

ROBOTICS PROJECT

TRACK ROBOT



MECHANICAL:

Design:

- Challenges: Ensuring proper traction, durability, and stability within CAD design while considering physical constraints.
- Tasks: Designing track layout, incorporating physical constraints, optimizing for durability.

Fabrication:

- Challenges: Material selection and fabrication techniques for tracks.
- Tasks: Selecting appropriate materials, considering 3D printing or other fabrication methods, assembly.

Mechanical Systems:

- Challenges: Understanding actuator properties and motion mechanisms for effective track movement.
- Tasks: Selecting actuators suitable for track propulsion, optimizing motion efficiency.

ELECTRICAL:

Circuit Design:

- Challenges: Designing PCB layout for motor control circuits.
- Tasks: PCB layout for motor drivers, considering space constraints, soldering.

Components Integration:

- Challenges: Selecting and integrating components while considering specifications.
- Tasks: Specifying motor controllers, analyzing datasheets, integrating components into the electrical system.

Power Systems:

- Challenges: Distributing power efficiently to motor drivers and other components.
- Tasks: Designing power distribution system, regulating voltage, managing current.

SOFTWARE:

Programming:

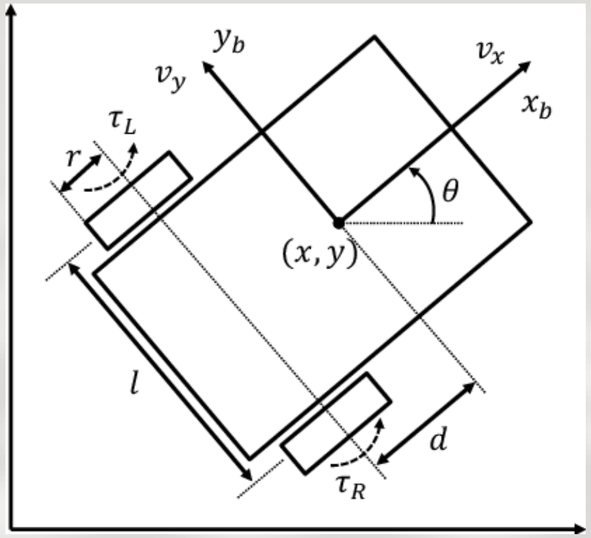
- Challenges: Developing algorithms for robot movement.
- Tasks: Implementing control algorithms in C++ or Python, optimizing for efficiency. Optional Vision control using neural networks.

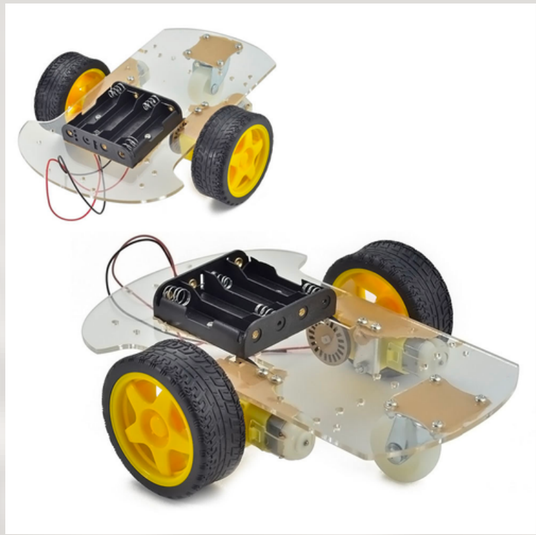
ROS:

- Challenges: Configuring ROS nodes and topics for communication.
- Tasks: Setting up ROS nodes for track control, configuring topics for sensor data exchange.

WHEEL ROBOT

THE SAFE OPTION





OVERAL TASKS:

Mechanical Engineering:

- Design: Designing chassis layout, selecting appropriate materials, optimizing weight distribution.
- Fabrication: Selecting materials, 3D printing or machining, assembly.
- Mechanical Systems: Selecting motors, designing gear trains, optimizing wheel traction.

Electrical Engineering:

- Circuit Design: PCB layout for motor drivers, soldering, considering space constraints.
- Components Integration: Specifying motors, integrating encoders, sensors, and motor drivers.
- Power Systems: Selecting power source, designing power distribution, managing power consumption.

Software Engineering:

- Programming: Implementing forward/backward movement, turning algorithms.
- ROS: Configuring ROS nodes for wheel control, communication topics.

THANK YOU

JULIAN LECLERC