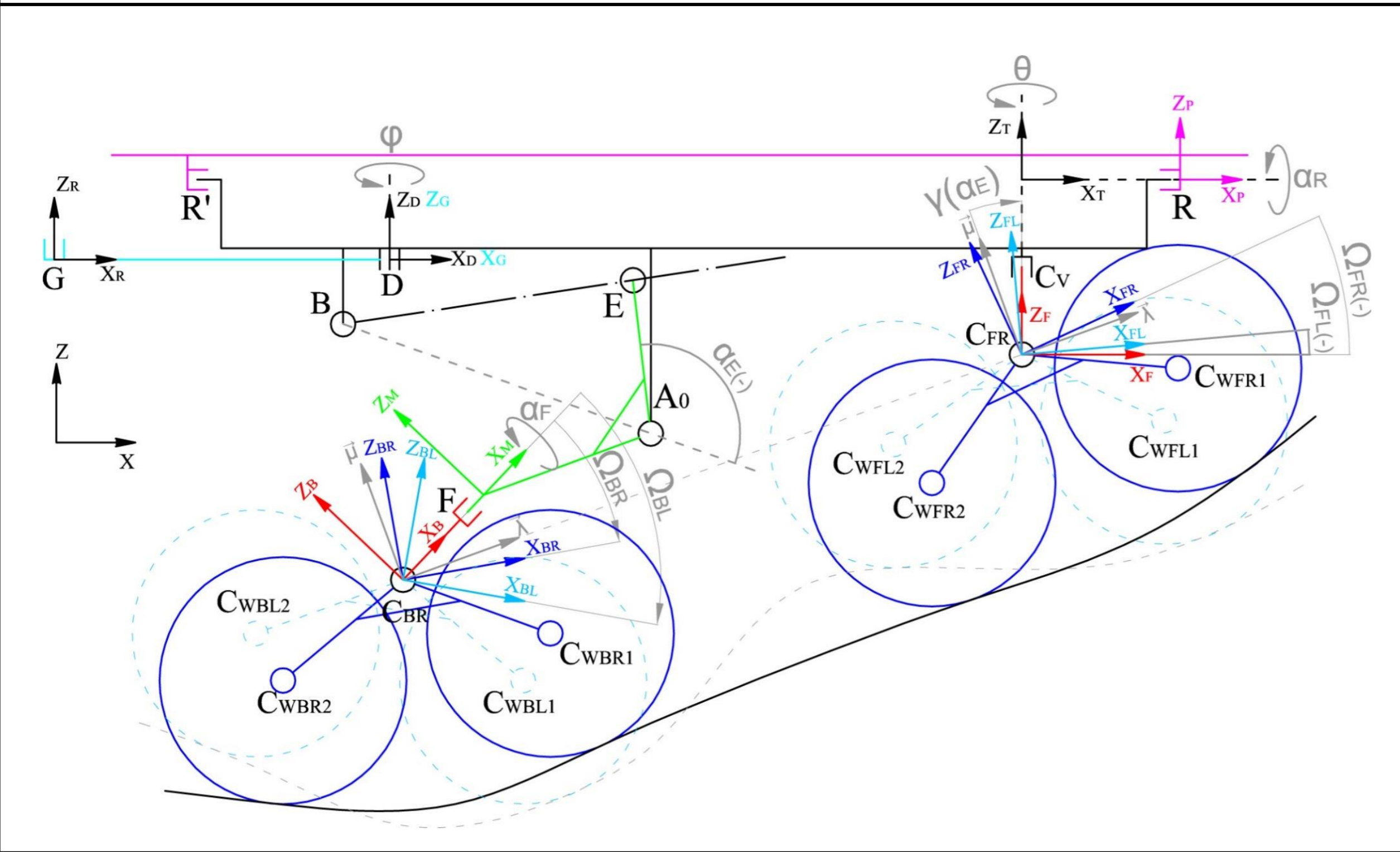


# Agri.q: UGV for precision agriculture



Functional design

- **6 D.O.F. passive**
  - $\Omega_{FR}, \Omega_{FL}, \Omega_{BR}$  and  $\Omega_{BL}$ : Rocker arm's pitch. Correct distribution of the normal forces by compensating the tangential irregularities of the soil
  - $\alpha_F$ : Back axle's roll. Correct distribution of the normal forces by compensating the transverse irregularities of the soil
  - $\Theta$ : Yaw trajectory
- **3 D.O.F. motorized**
  - $\alpha_R$ : Landing platform's roll angle
  - $\gamma(\alpha_E)$ : Landing platform's pitch angle. Sunlight collection and steep hill climbing
  - $\varphi$ : Mobile support's angular position in order to increase the workspace of the robotic arm

- Each front driving unit is equipped with a speed control
- Each back driving unit is equipped by a torque control
- The rover is equipped by a robotic arm with 7 D.O.F.

**FUTURE WORKS**

- Test phase
- Mechatronic system architecture

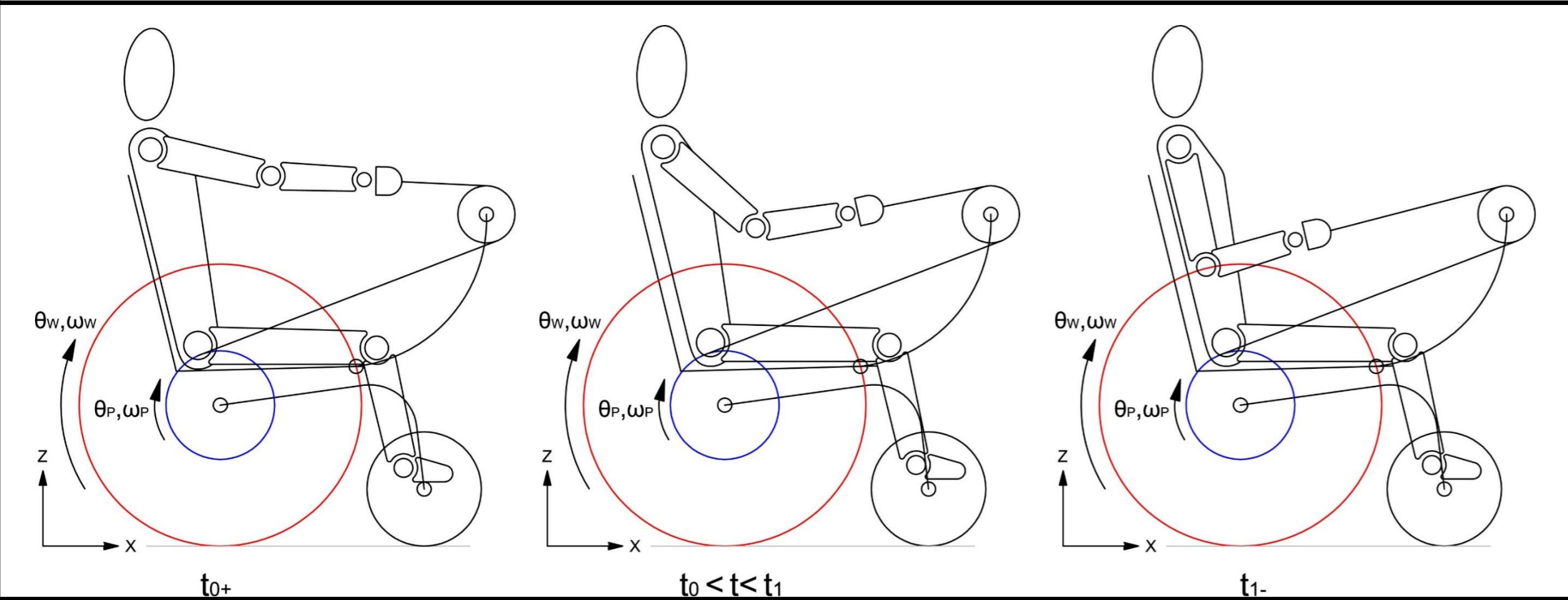


Render

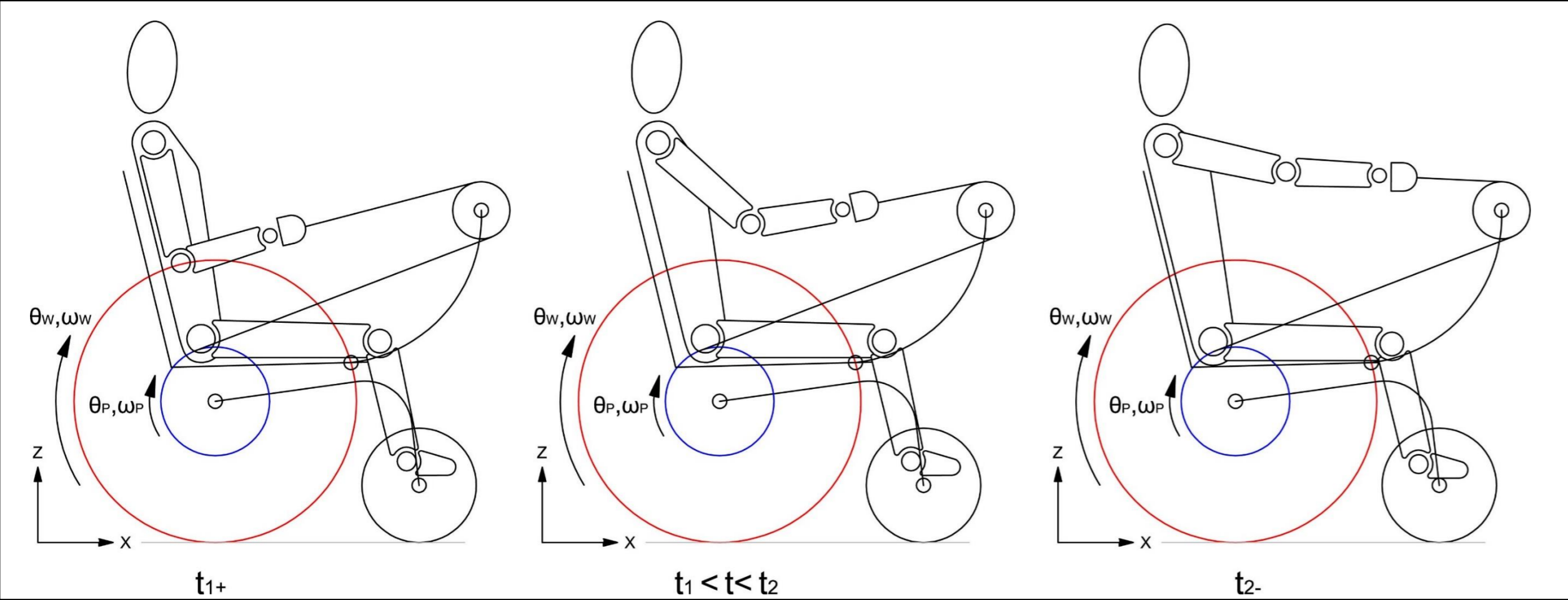


Prototype

# Handwheelchair.q: Manual wheelchair with an innovative system of propulsion



Functional sketch - Traction phase



Functional sketch - Recovery phase

**STATISTICS**

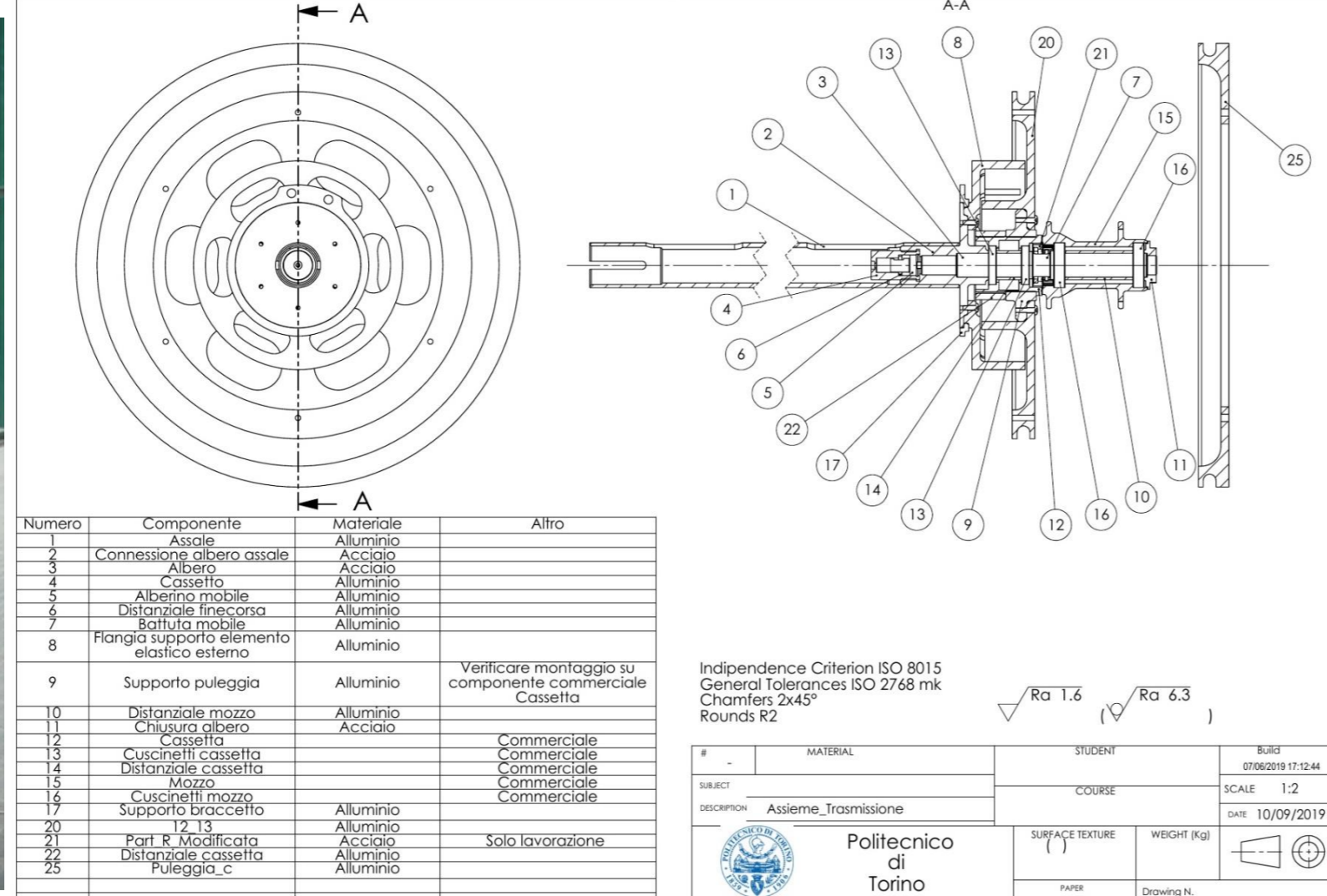
- 73 Million people require a wheelchair
- 42 Million users suffer from upper limbs injuries

**MAIN GOALS OF HANDWHEELCHAIR.Q**

- Facilitate and extend movement
- Solve the shoulder pain
- Increase independence of the users



Handwheelchair.q – First prototype – Dec. 2017



**FUTURE WORKS**

- The second prototype is in progress
- Prototype validation
- Kinematic and dynamic analysis
- Movement analysis
- Biomechanic analysis

