

Development of an Autonomous “Cleaning Buddy” in association with Stadtreinigung Hamburg (HiCCE)

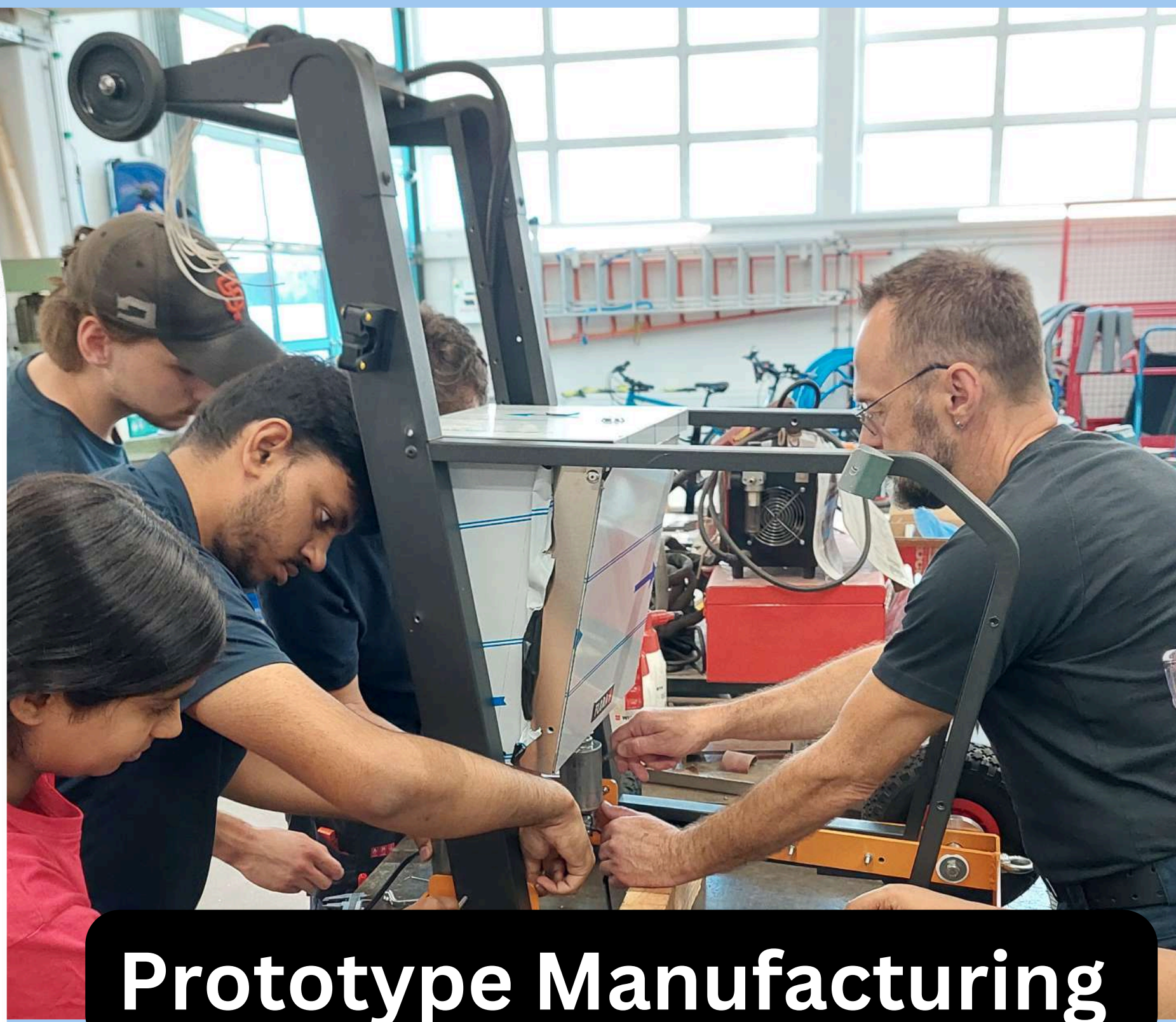
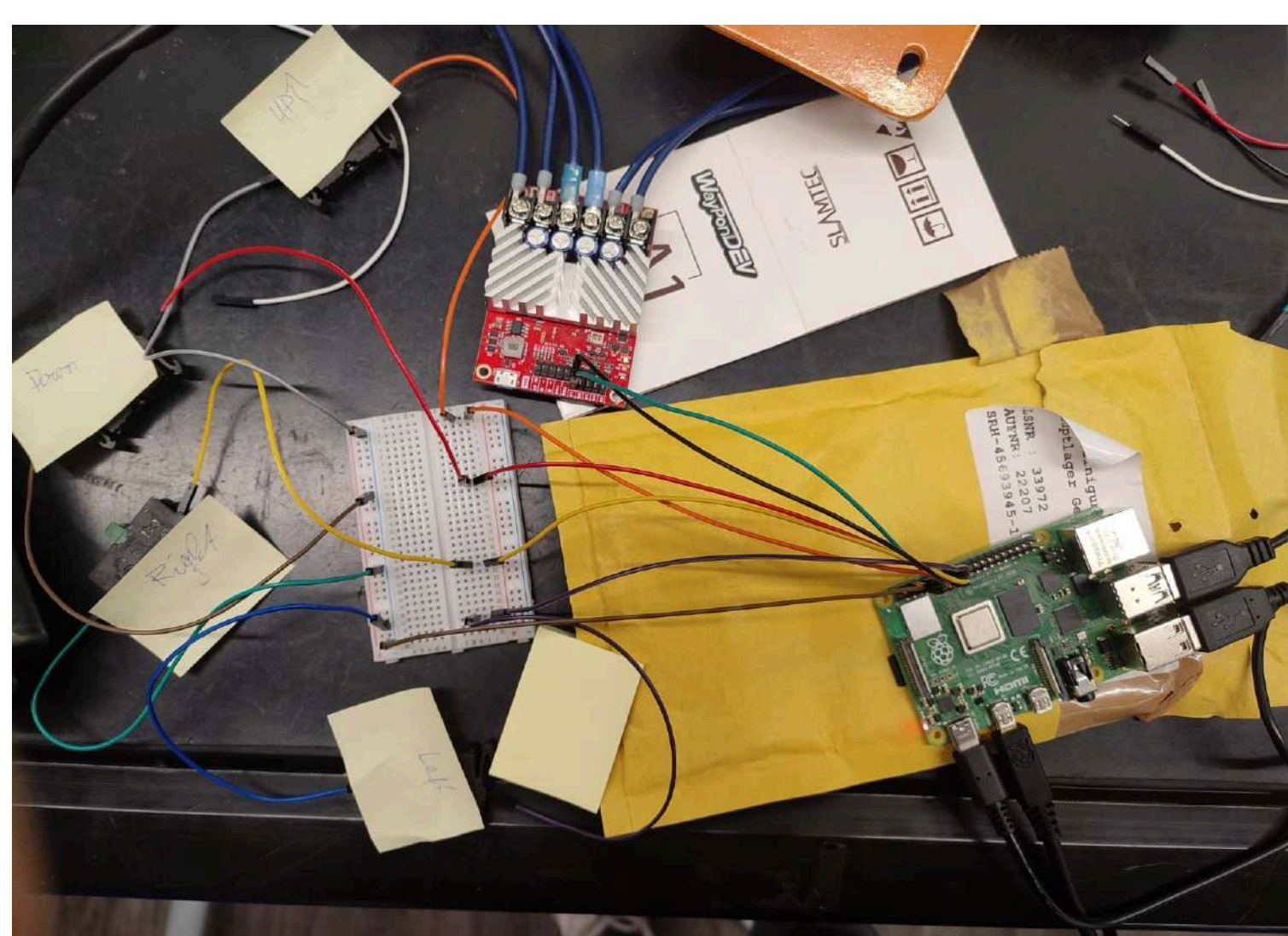
Team: Aditya Wadatkar, Balaji Boggarapu, Kinjal Doshi, Nupur Avasare, Rutwik Bhangale and Sana Khaliq.

Problem Statement: Employees at SRH face challenges in carrying essential cleaning equipment due to limited parking, resulting in frequent trips back to the truck and significant time spent organizing tools.

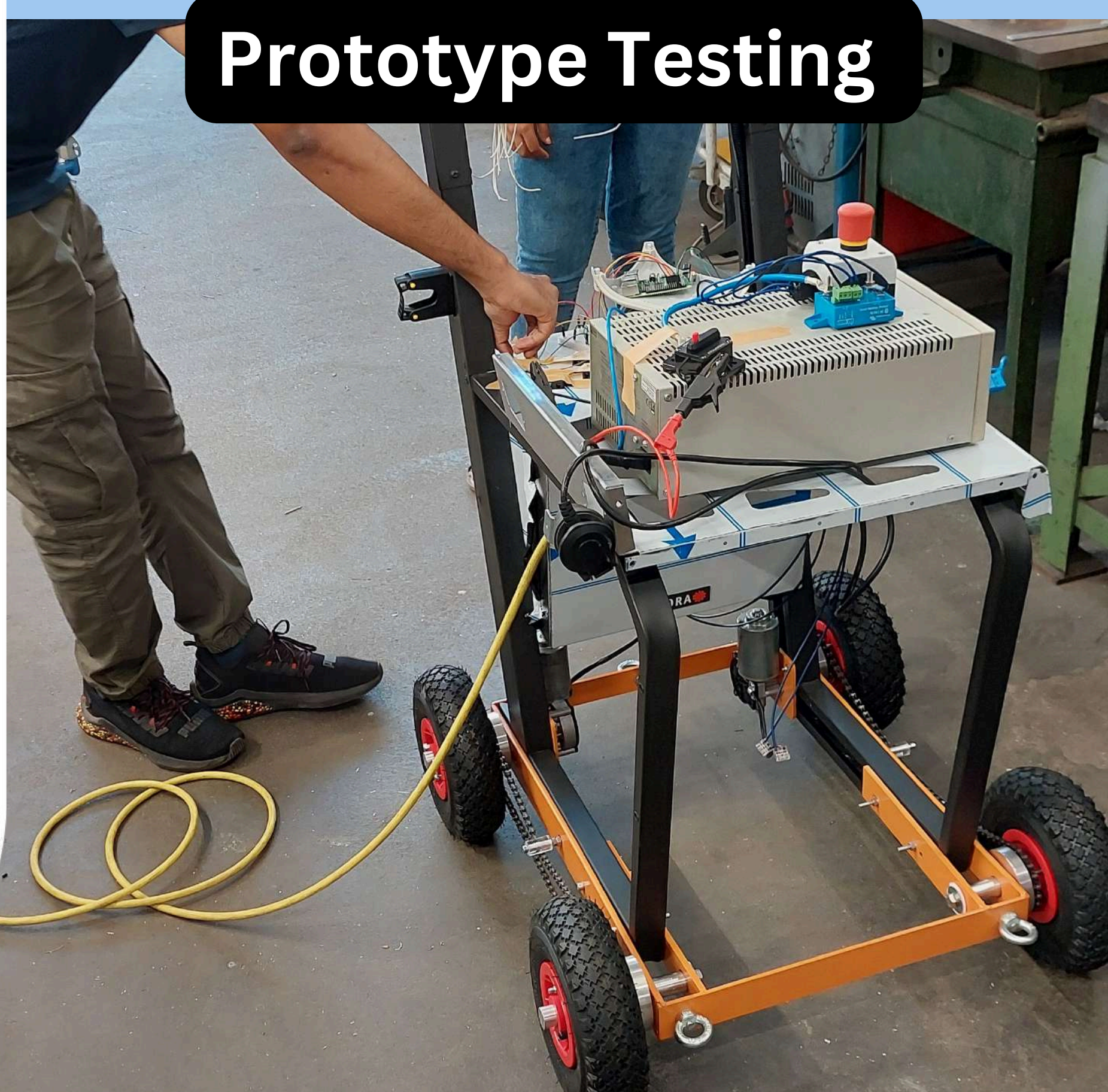
Objective: The main objective was to enhance and refine the prototype developed by the previous team, focusing on mechanical improvements and incorporating electronics to enable robot movement via push buttons.

Electronics

The Cleaning Buddy's electrical functions consist of an MCU that is linked to the motor driver and buttons for movement. Two motors are connected to the motor driver, and the motor driver is connected to the power. The buddy's movements and functions are supported by programming in the MCU.



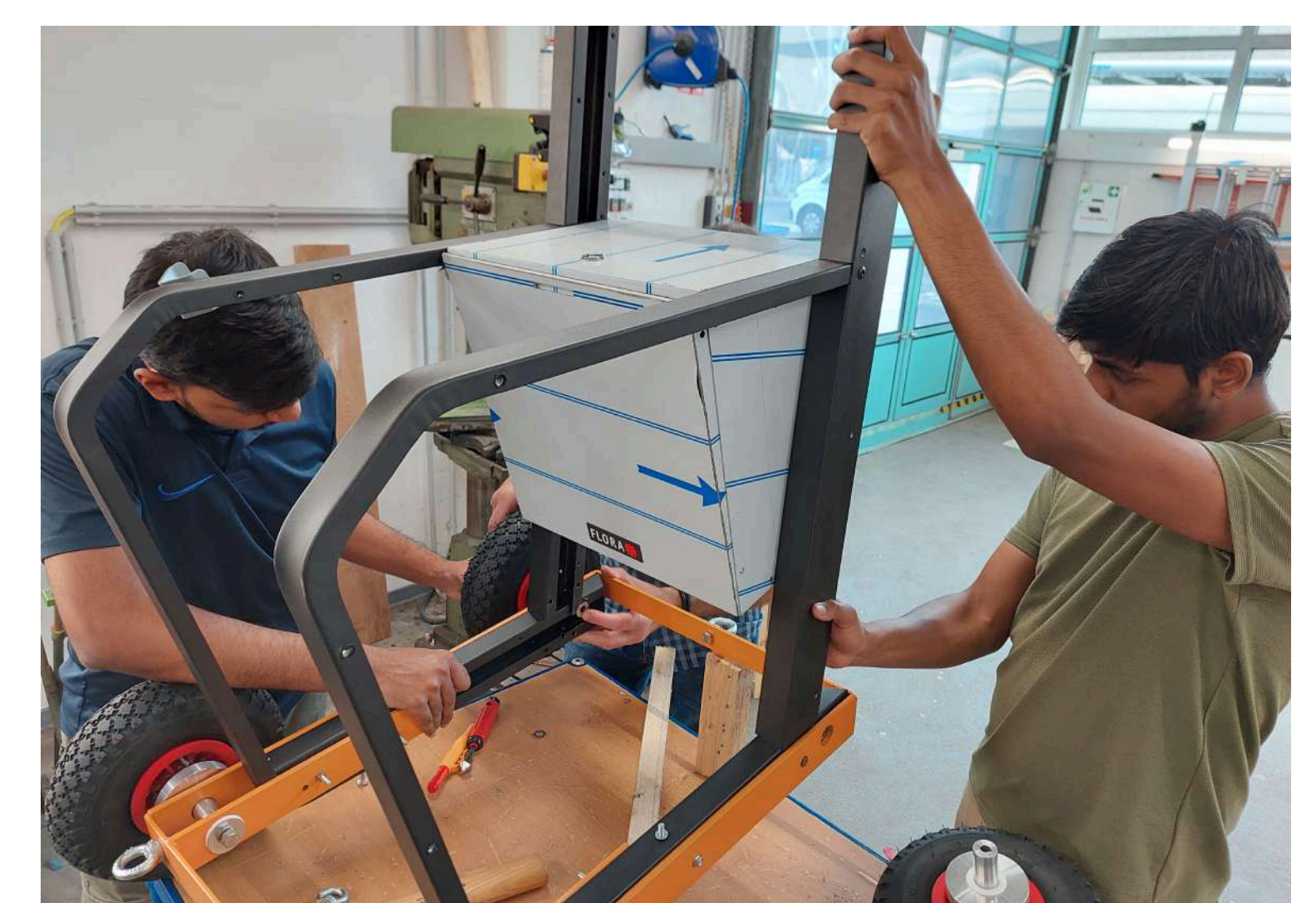
Prototype Manufacturing



Prototype Testing

Mechanical

The Cleaning Buddy is powered by two high torque motors, which deliver power to all four wheels through a chain sprocket mechanism. This setup ensures versatile and stable movement across various terrains. The robot features a control panel for easy maneuverability. Its design boasts strong structural integrity and robustness, enhancing both durability and reliability.



Developments in the Current Phase:

- Constructed the main framework of the Cleaning Buddy (develop the axle and driving and power transmission mechanism).
- Configured movement controls using a push-button interface.
- Implemented steering control for precise maneuverability.
- Developed and assembled housing for electronic components, ensuring protection and organization.

Developments to target in Subsequent Phase:

- Integrate autonomous functionality through the addition of an RP Lidar Sensor and GPS Module.
- Develop robust housing for electronic components.
- Optimize aesthetics and ergonomics for improved user experience.
- Implement computer vision applications and enhance advanced control systems.
- To select a suitable battery according to the buddy's requirements