

Marina Z. Rocha Pedro E. Nunes Gabriel A. Dorneles Richard J. C. Assis Vitor W. Anello Luís F. M. Quadros Guilherme M. Burkert Cris L. Froes Kristofer S. Kappel Luiz E. V. Sparvoli Andrei Juncowski Sofia Botesini Fernando P. Mendes Nicolas F. Dias Othavio C. Correa Manoela R. Suita Alessandro G. Cruz Miriâ A. Evangelista Luis F. F. Silva Jardel D. S. Dyonisio João F. S. S. Lemos Rodrigo S. Guerra Paulo L. J. Drews Jr

BORIS

FBOT is a team from the Universidade Federal do Rio Grande (**FURG**). In this presentation we describe some of the contributions of the team, as well as present the Brazilian Open Robot for Indoor Service (**BORIS**).

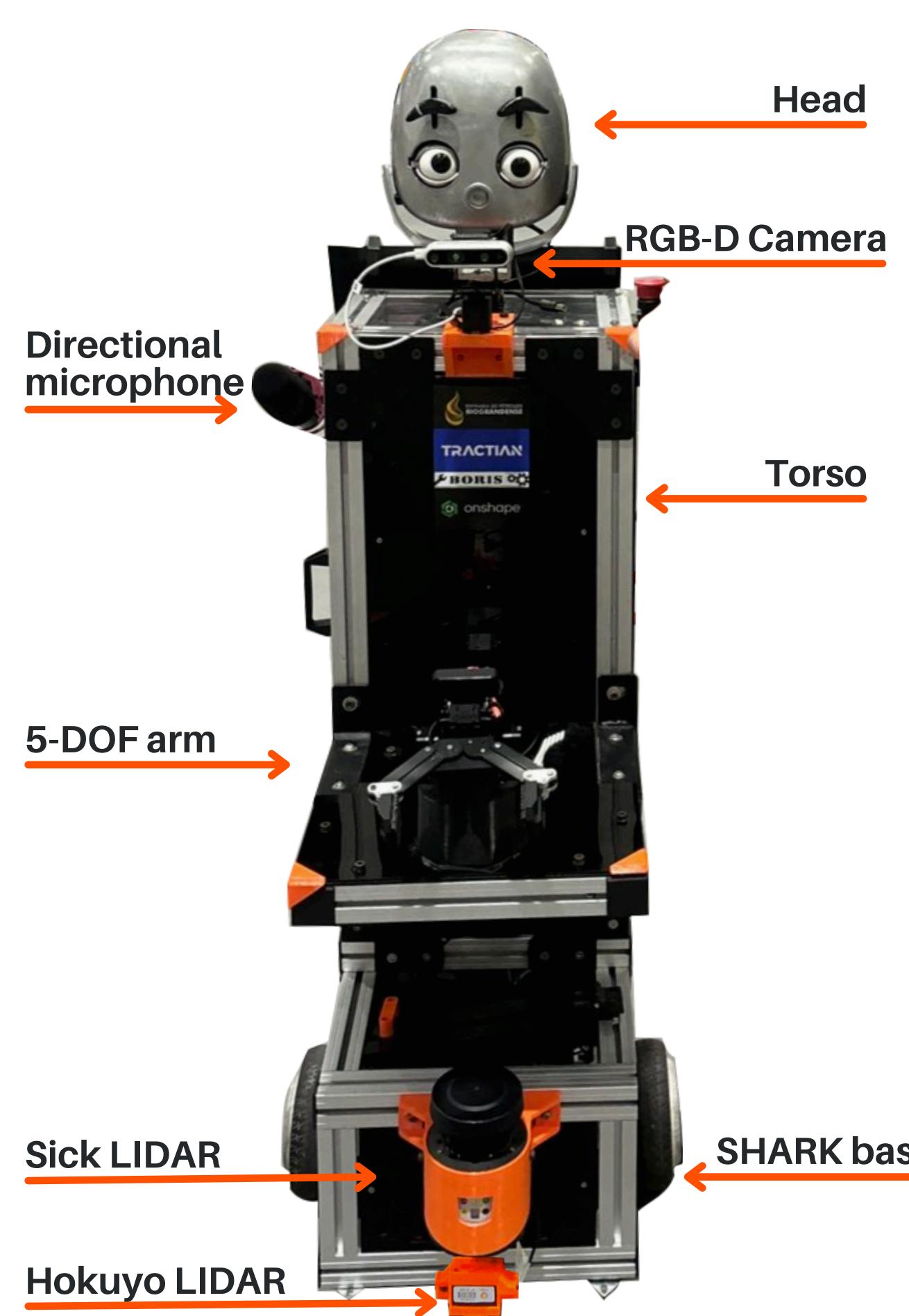


Fig. 1: BORIS' mechanical construction.

ROS2 and YASMIN

With ROS1 reaching end-of-life in May 2025, our team has initiated the transition to **ROS2 Humble**. The ROS2 ecosystem offers packages such as **Nav2**, **Movelt2**, and **SLAM Toolbox**. As our previous state-machine library, SMACH, has not kept pace with ROS2 development, we replaced it with **YASMIN** (Yet Another State MachIne). During this transition, several team members actively contributed to the development of YASMIN, as we believe it is a reliable solution to state machine-based logic in ROS2.

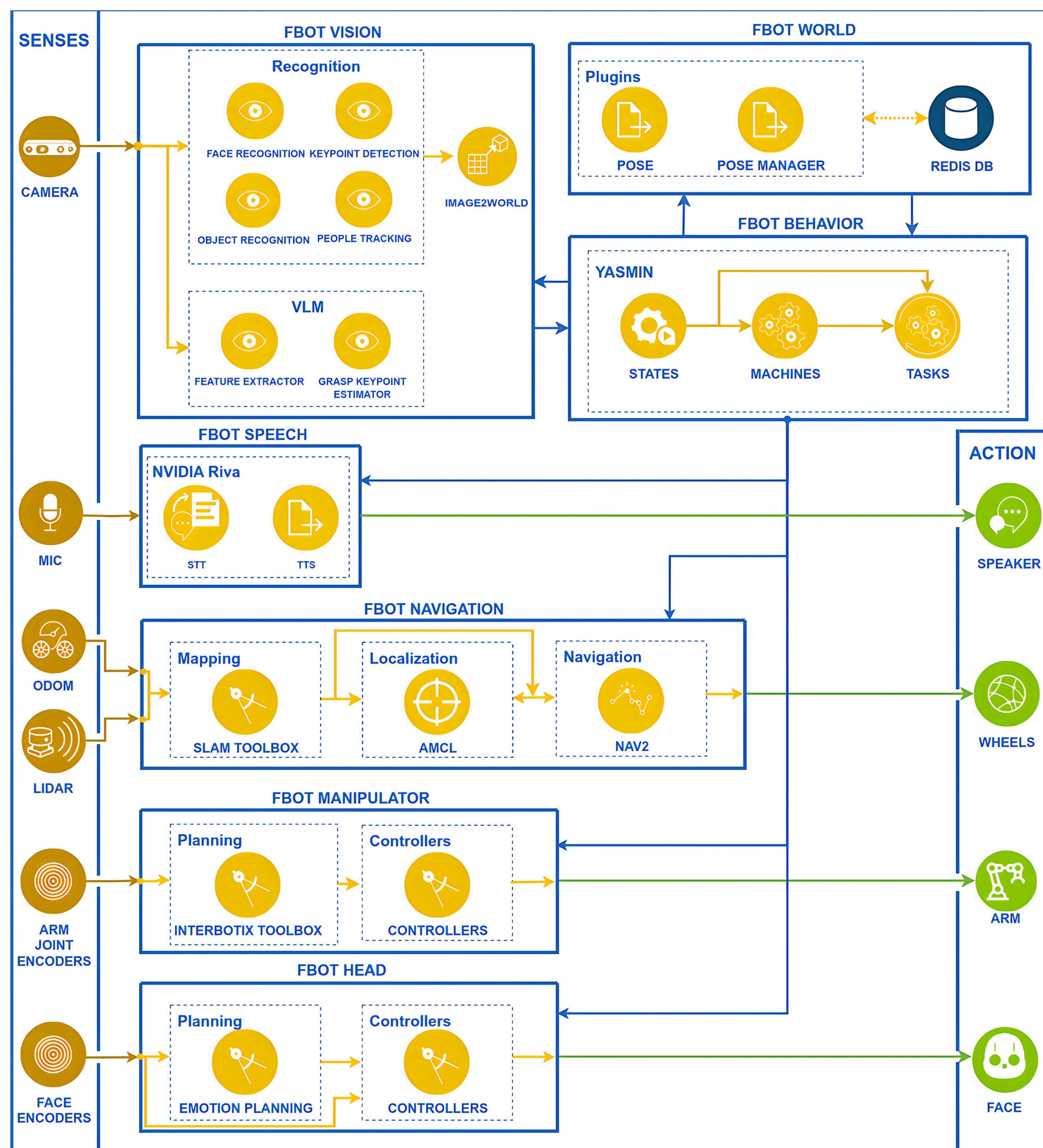


Fig. 2: Diagram of BORIS' architecture.

Hot-swap battery system

To ensure uninterrupted operation, we developed a hot-swap battery system, allowing battery replacements without shutting down the robot. The robot uses four 36V battery packs, repurposed from self-balancing scooters, with replacements performed two at a time to maintain power stability. To address voltage imbalances, high-power diodes were added to each battery pack, isolating them from one another. This configuration ensures that current flows only from each battery to the system's devices, preventing backflow into other batteries.

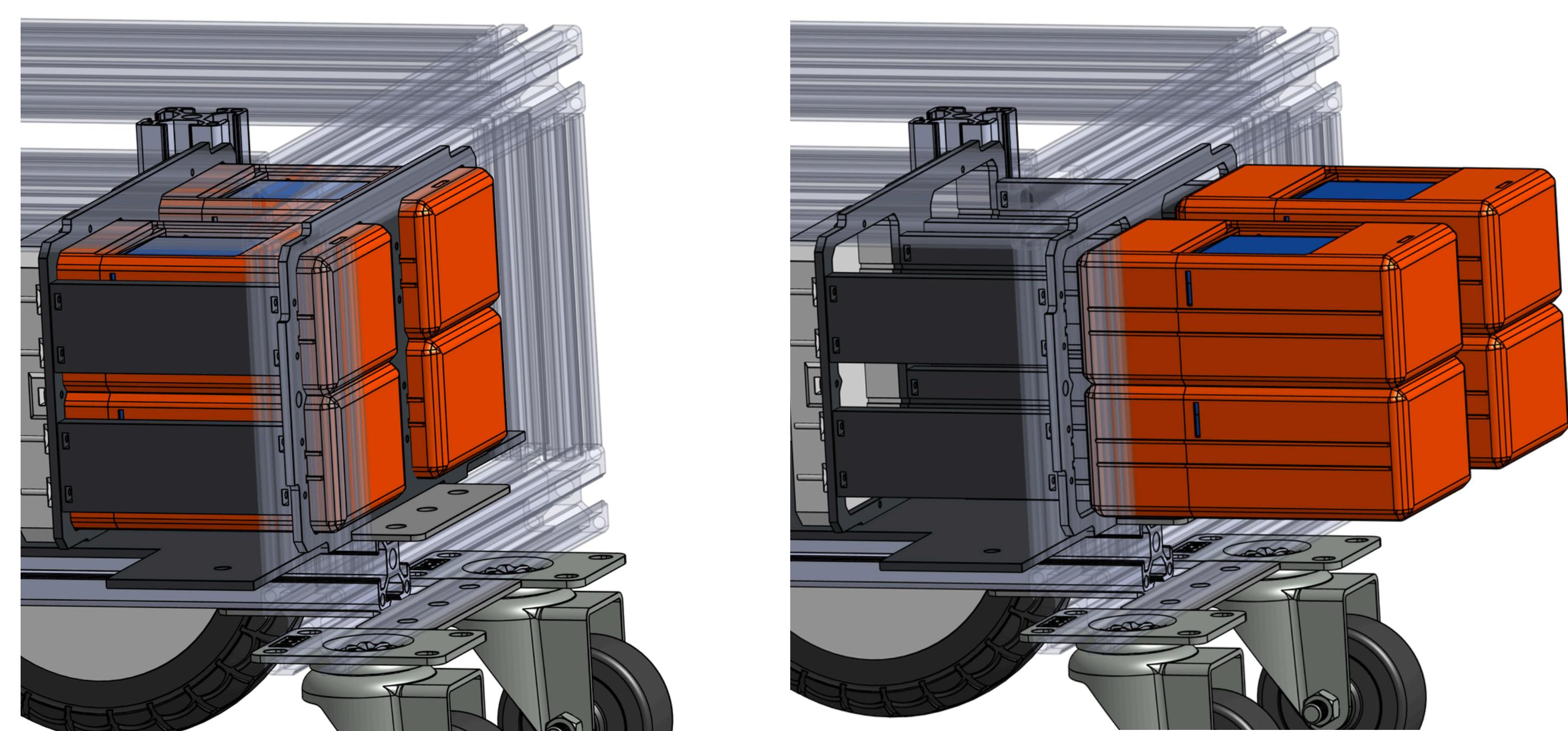


Fig. 3: The hot-swap mechanism. Batteries can be replaced one at a time if needed.

Constructing GPSR tasks through Code Agents

