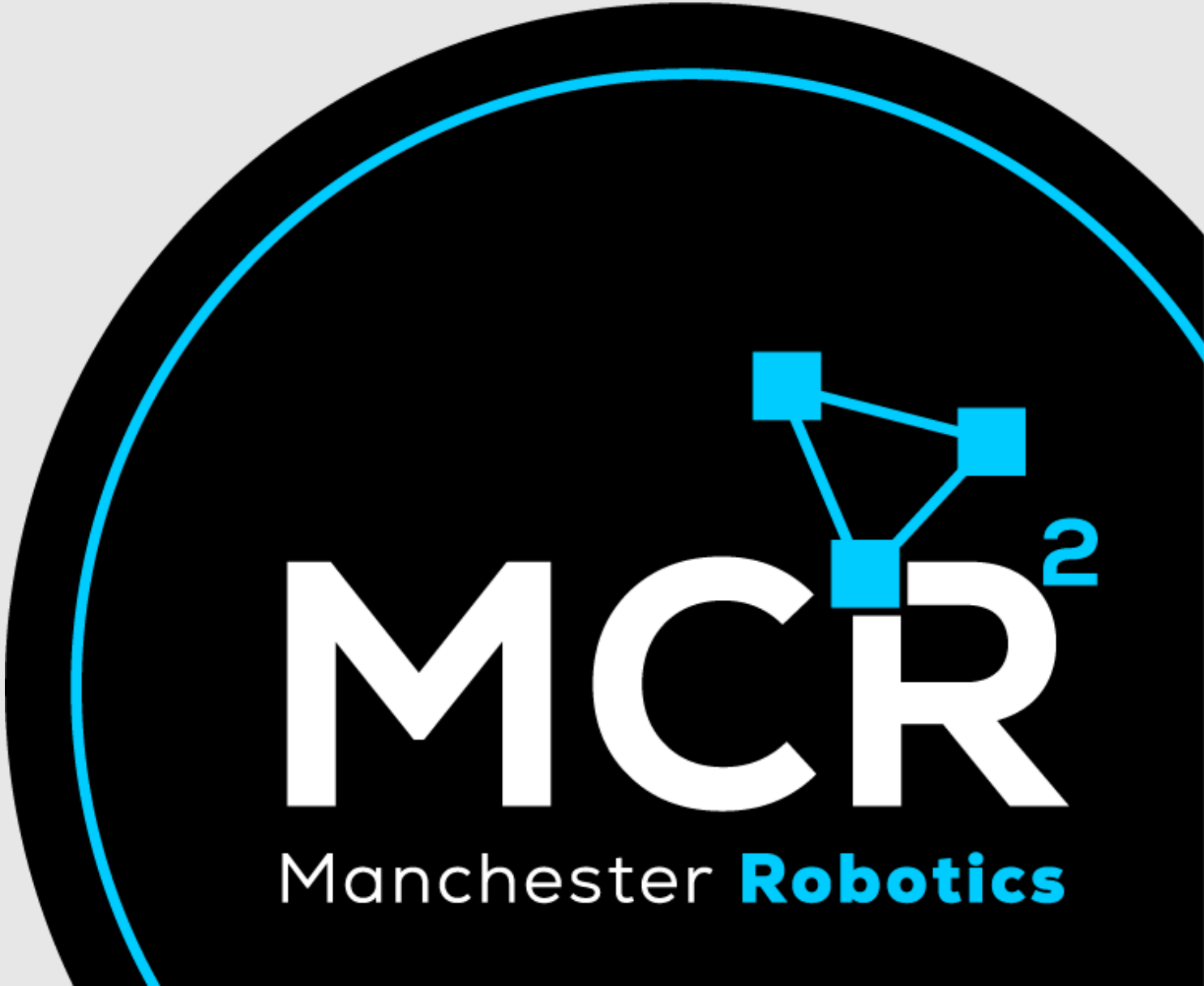
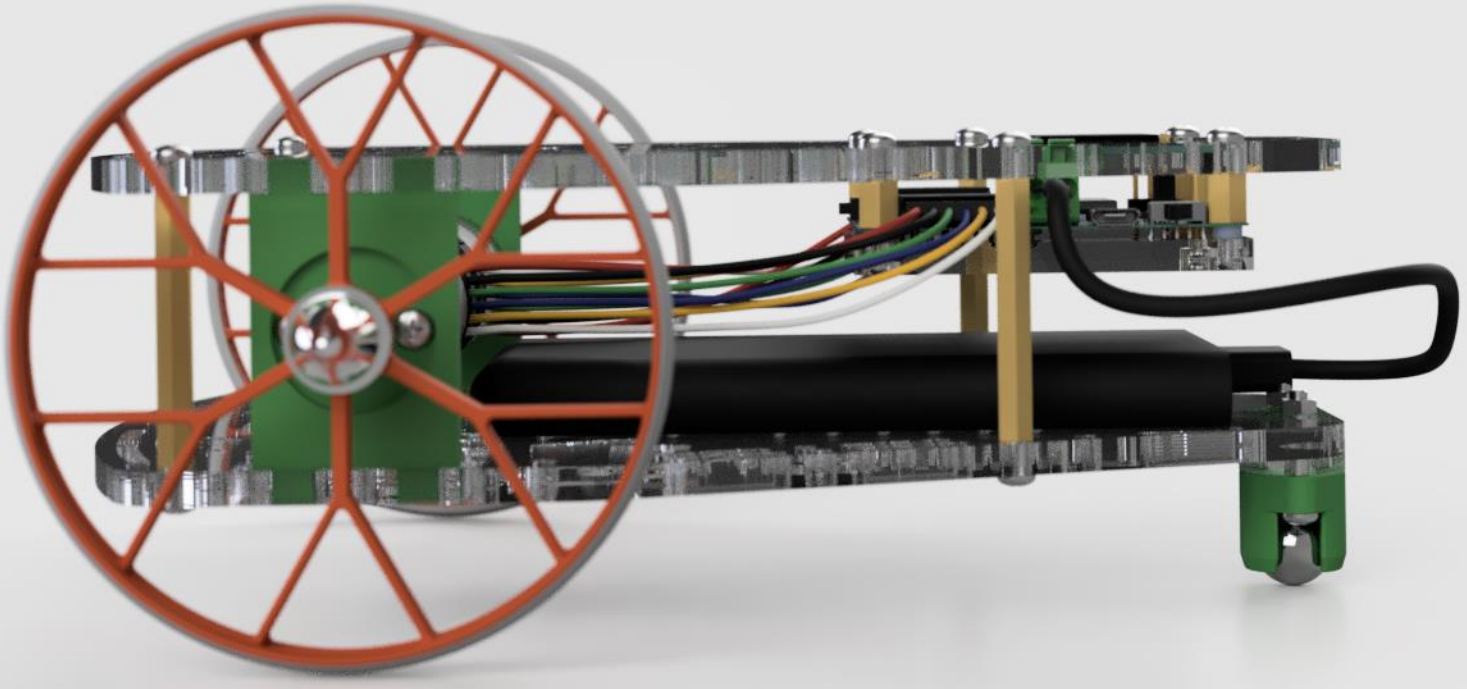
{Learn, Create, Innovate};

Puzzlebot



Puzzlebot



MCR² Manchester Robotics

Puzzlebot

- A flexible, low-cost platform that can be developed by the user and become “smarter”.
- The Puzzlebot was born as an answer to the concept of robotic democratisation.
- The governing philosophy is that customers are motivated to learn robotics by the appeal of advanced features, which offers far more value than over-simplified proxies with high cost, and limited utility.

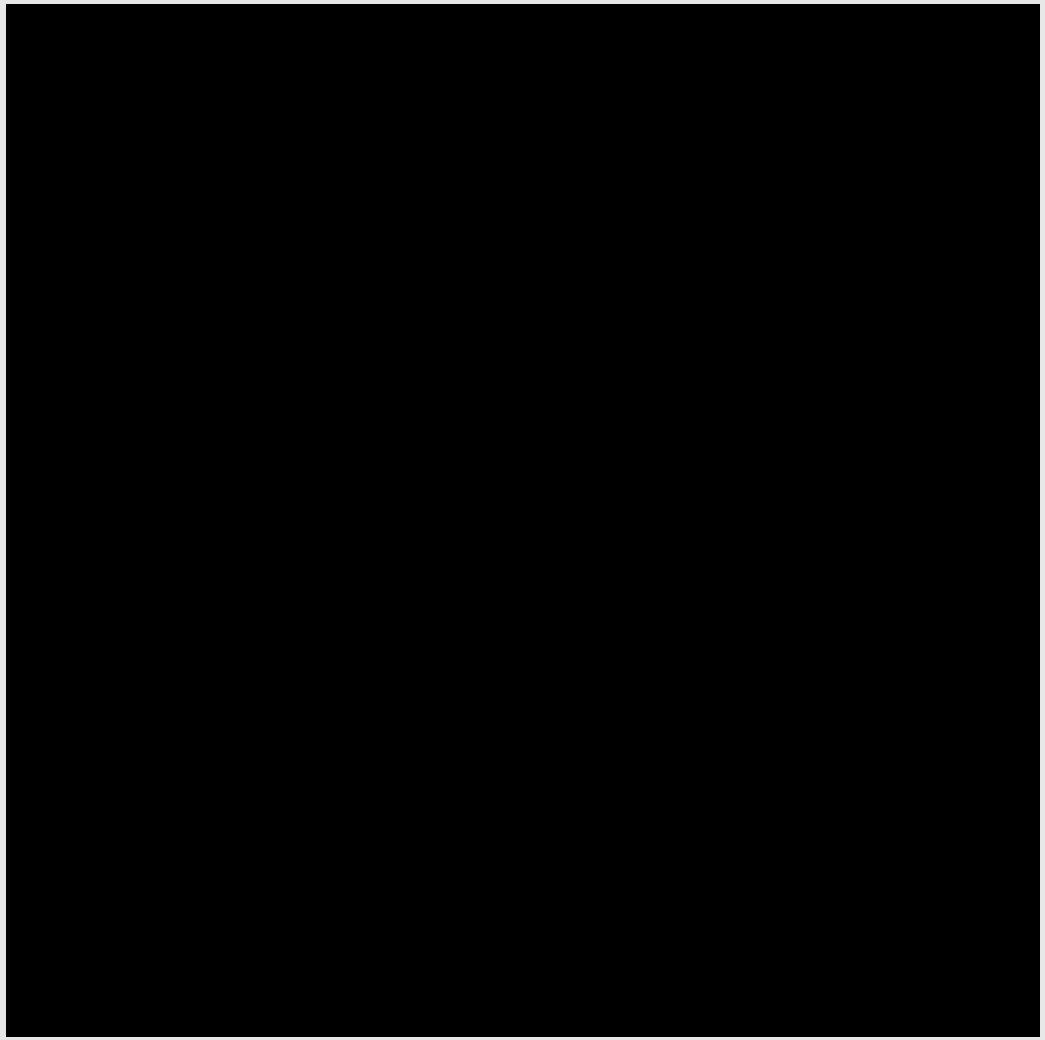
Puzzlebot

“For us, robotic democratisation is not a concept… it’s our way of thinking, working… being.”

Professor Constantinos Soutis, Director

Puzzlebot

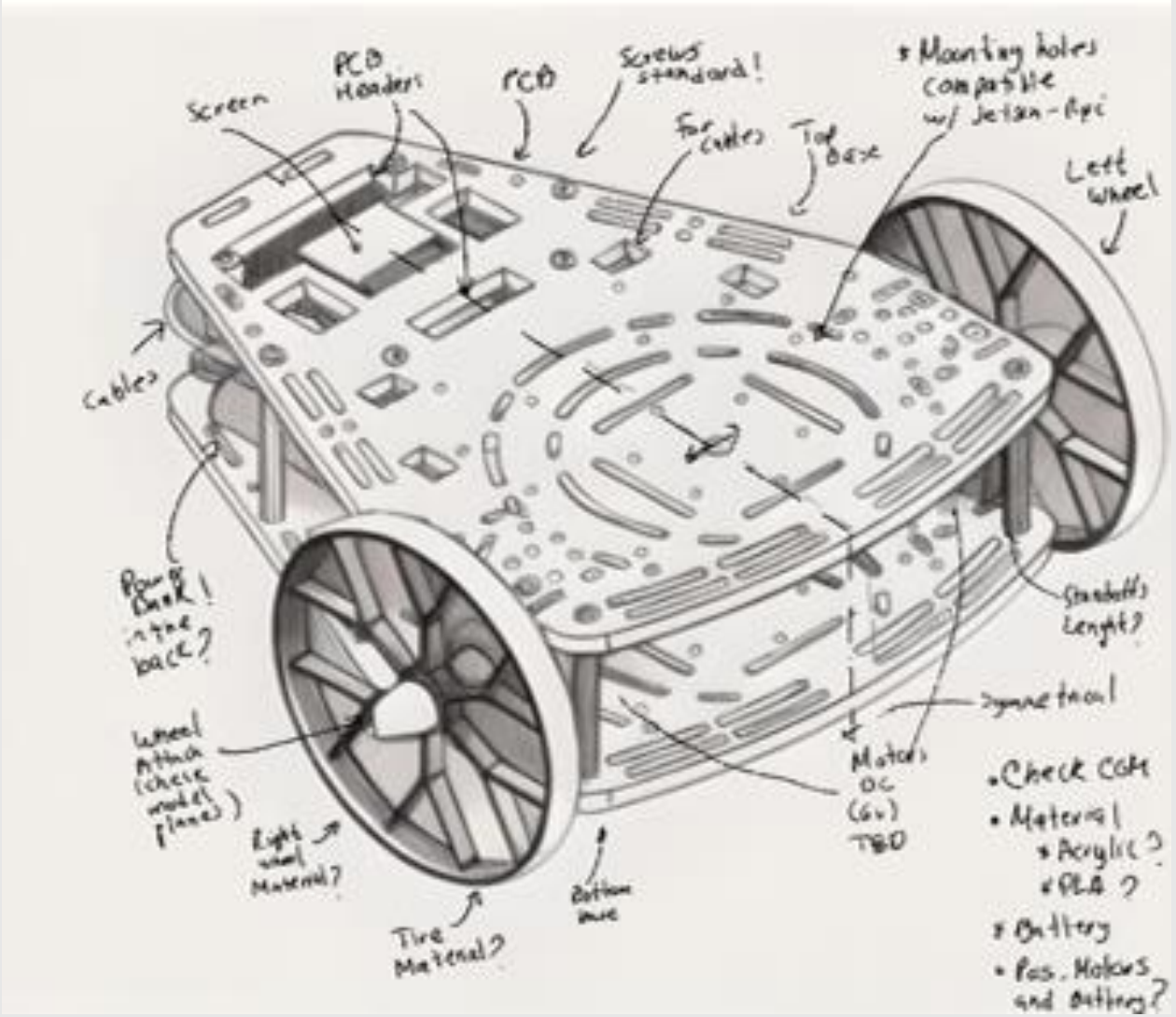
- Puzzlebot is a universal tool for robotics, to help others learn, create, and innovate their own robotic projects.
- The Puzzlebot is a cross-platform, open-source, plug-and-play mobile robot.
- Capable of accommodating 3rd party off-the-shelf components, keeping unit costs low and education available to everyone, thereby democratising access.



Puzzlebot

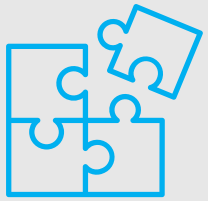
- Programed in different languages, catering to learner's preferred starting languages.

- Provides continuity from entry-level access to research-level functionality ensuring learners to focus on progressing skills rather than having to constantly switch between robotics platforms.



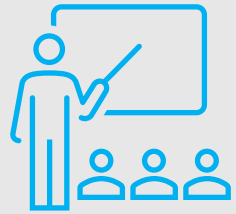
What makes it different?

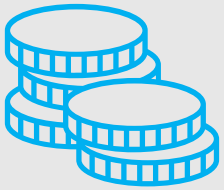
Advanced Capability
The circuit board is designed around powerful microprocessors and microcontrollers.



Versatile Feature-set
Our circuit board and software are designed to be versatile to accommodate add-on components.

Basic to Advanced Courses
Basic to advanced robotics courses developed alongside our partnership with NVIDIA



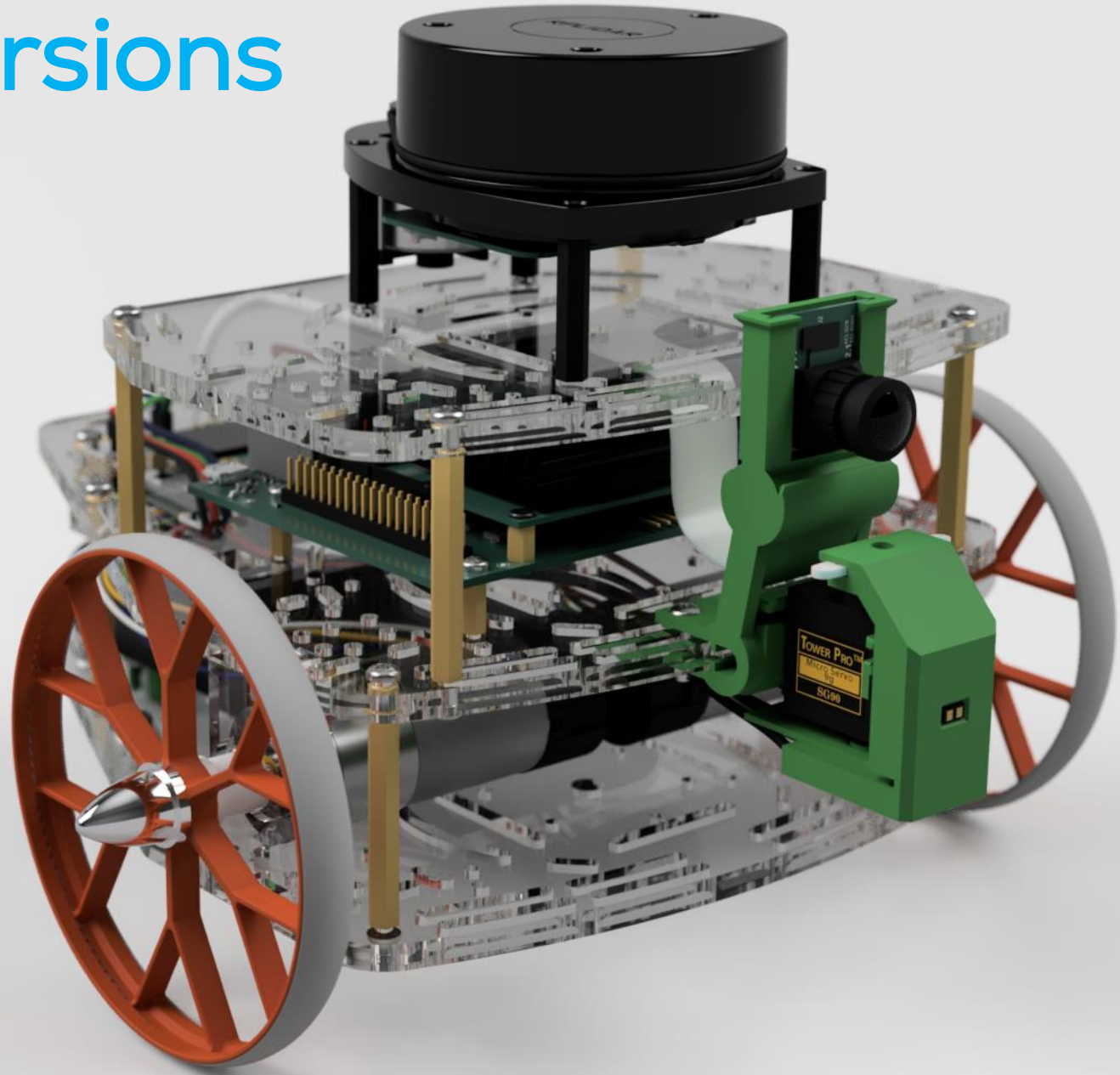


Accessible Price Point
We design with the intent of manufacturing at high volume to keep unit costs low.

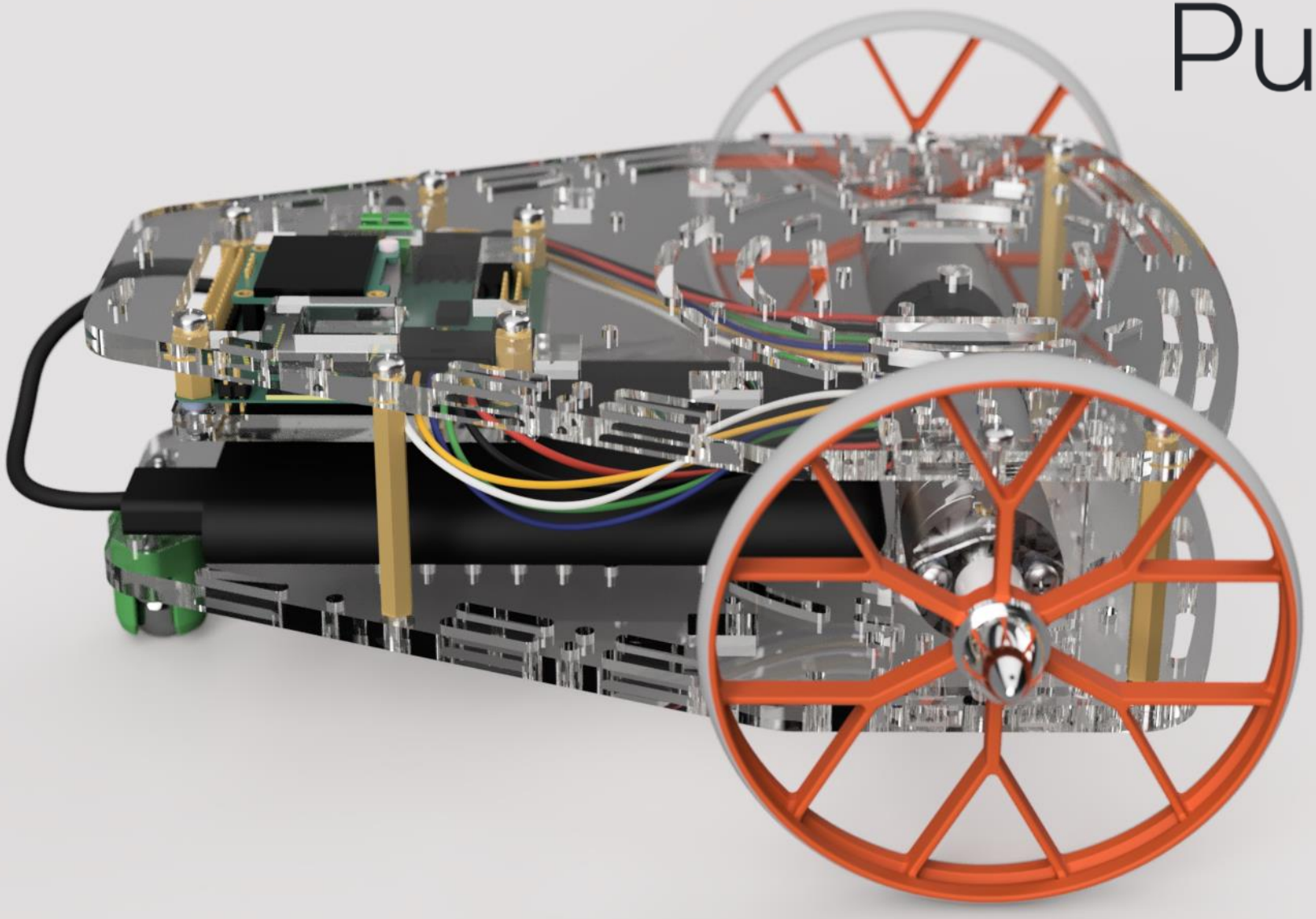
VERSIONS

Puzzlebot: Versions

- The Puzzlebot is available in various versions, offering a broader range of opportunities to learn about robotics.
- The main three versions are:
  - The Hacker Edition
  - NVIDIA Jetson (NVIDIA Partnership)
  - RPi Edition (Raspberry Pi Partnership) *



Puzzlebot
Hacker Edition

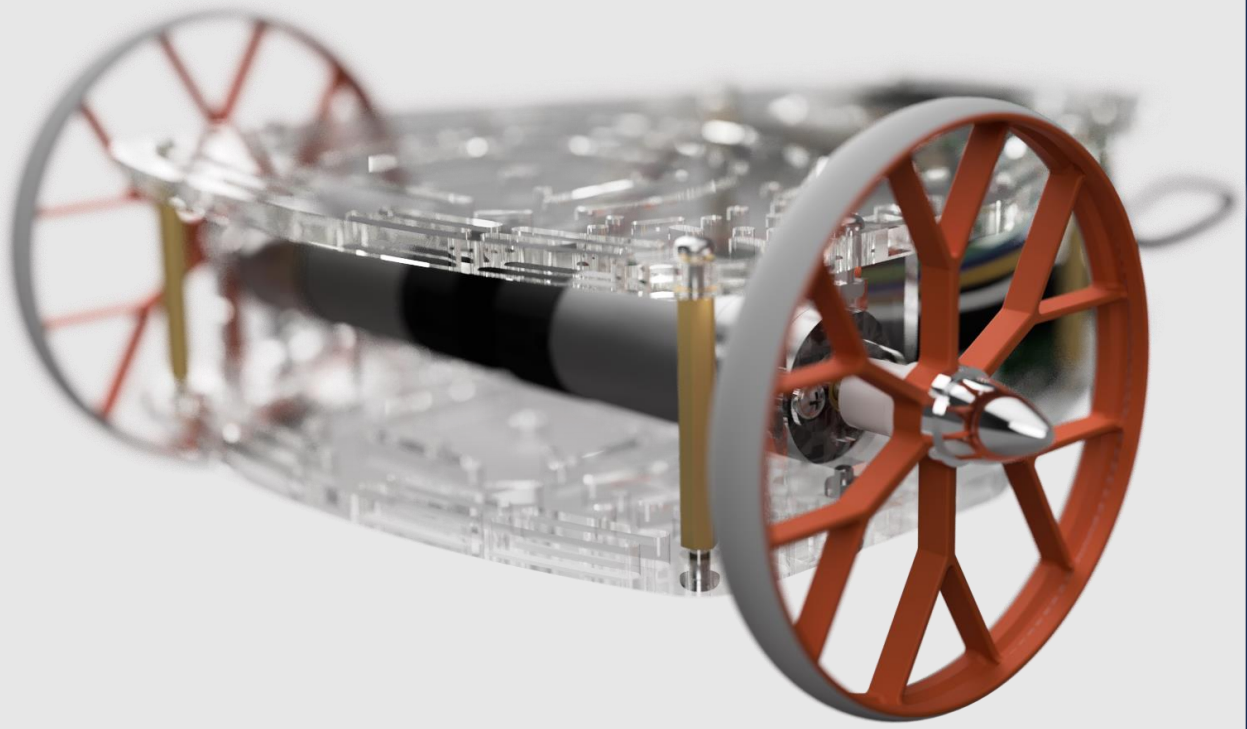


MCR2
Manchester Robotics

Puzzlebot: Hacker Edition

Puzzlebot Hacker Edition

- Contains all the essential components needed to access meaningful robotics capabilities
- User-friendly platform for incorporating a wide range of advanced add-on feature sets.
- Powered by the Hackerboard for algorithms which require real-time processing capabilities, such as:
  - Low-level control,
  - Navigation,
  - Obstacle avoidance,
  - 2D-LiDAR-based SLAM,
  - Fault-tolerant control.

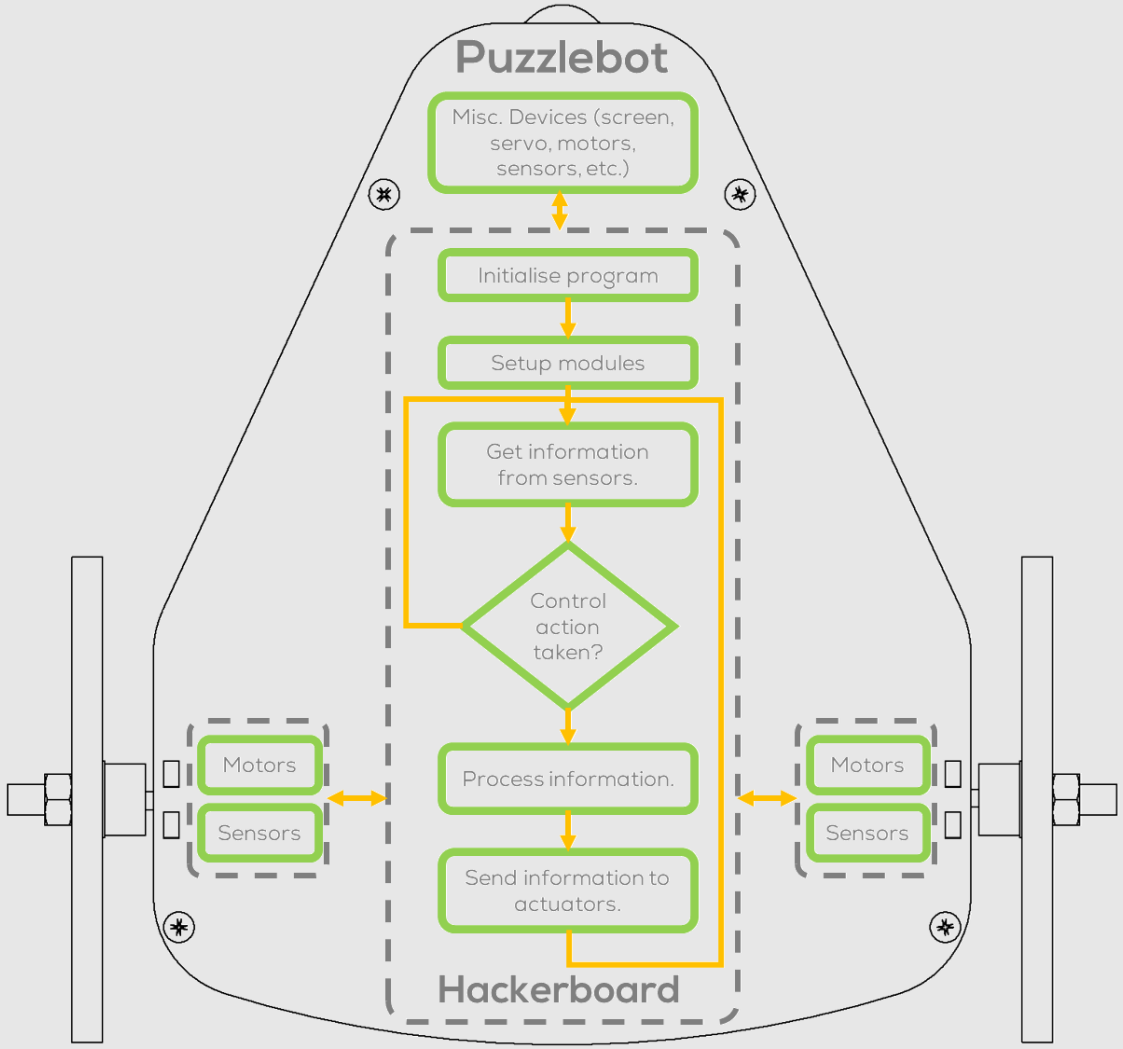


Puzzlebot: Hacker Edition

Control Mode: Standalone Configuration

- The user directly programs the Hacker Board.
- Libraries for control and communication with computing units, sensors, and actuators are provided by MCR2.
- 3rd Party peripherals can be attached.

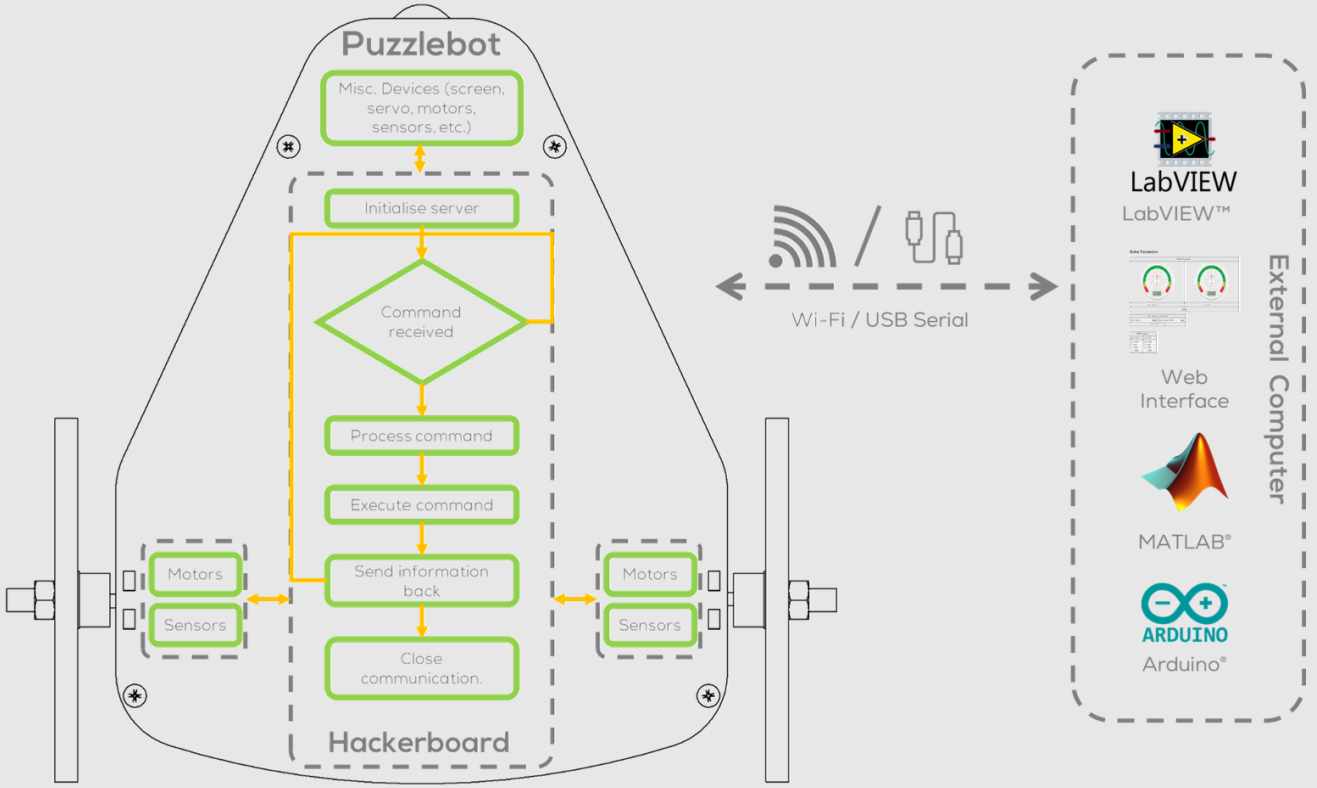
Hackerboard



Puzzlebot: Hacker Edition

Control Mode: External-Control Configuration

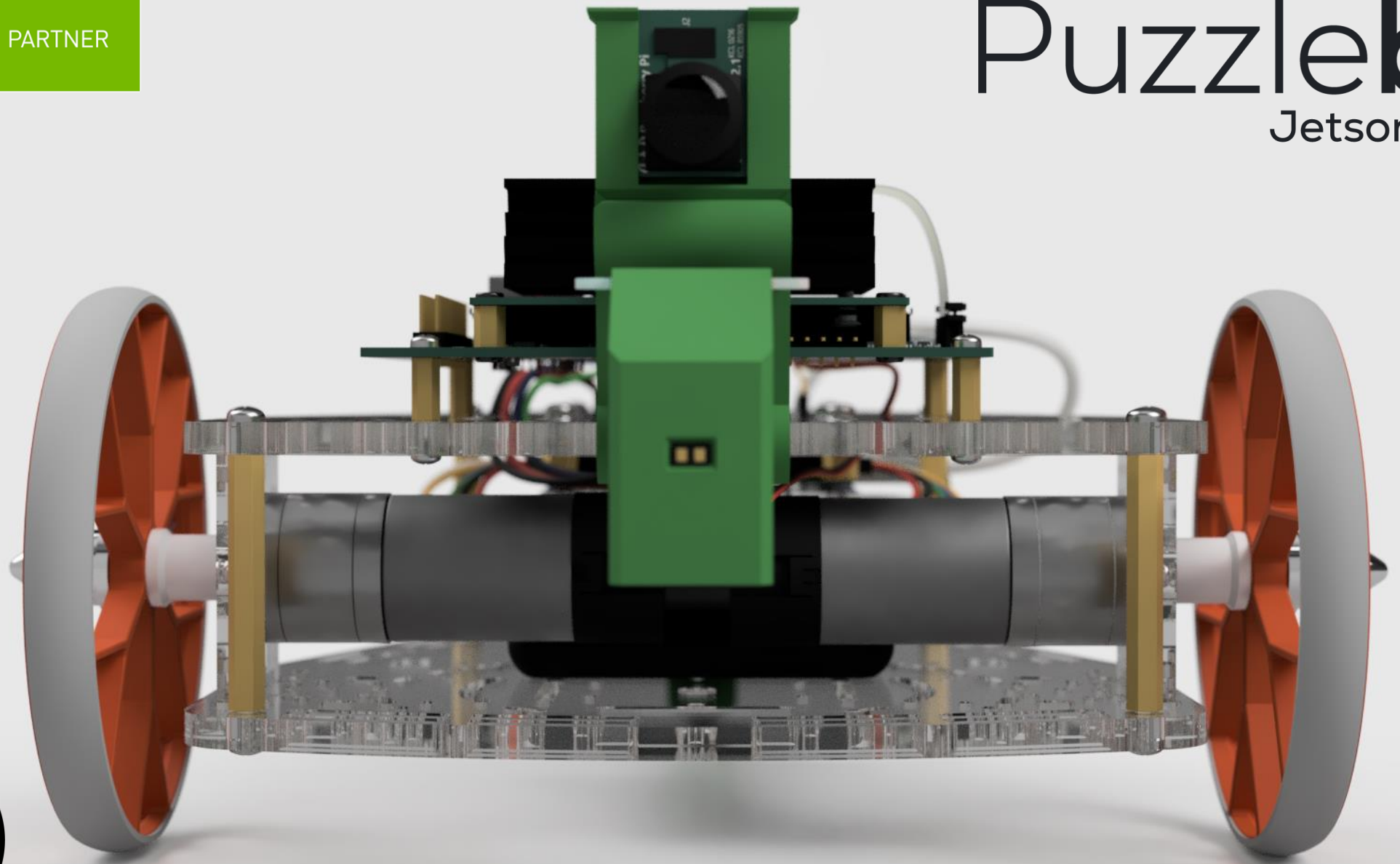
- The robot is controlled from an external computer via Wi-Fi or Serial Communication.
- The internal firmware and libraries for communicating with the robot, its sensors and actuators are provided by MCR2.
- Basic web interface for configuring and testing provided.
- MCR2 provides MATLAB , ROS and LabVIEW libraries for communicating with the robot.
- Python, MATLAB and LabVIEW simulators are provided. No extra libraries for required working.



NVIDIA PARTNER

Puzzlebot

Jetson Edition



MCR² Manchester Robotics

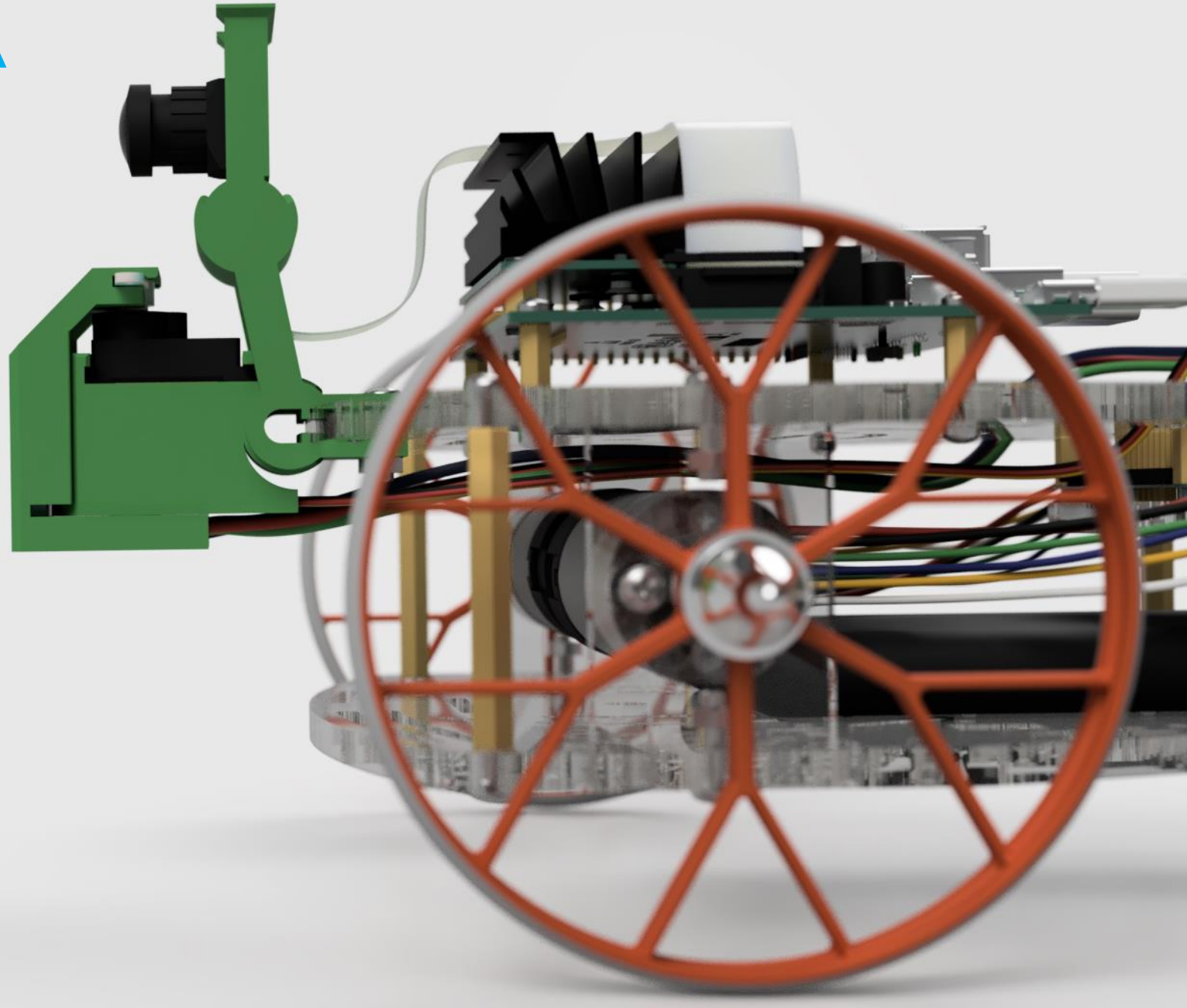
Puzzlebot: NVIDIA Jetson Edition

Puzzlebot NVIDIA JETSON®

- Developed in collaboration with NVIDIA, combines the power of NVIDIA's Jetson platform with Manchester Robotics' expertise in hands-on learning solutions.
- Designed to inspire and empower the next generation of robotics engineers, this advanced robot is perfect for mastering concepts in Artificial Intelligence, Computer Vision, and Autonomous Navigation.

Puzzlebot: NVIDIA Jetson Edition

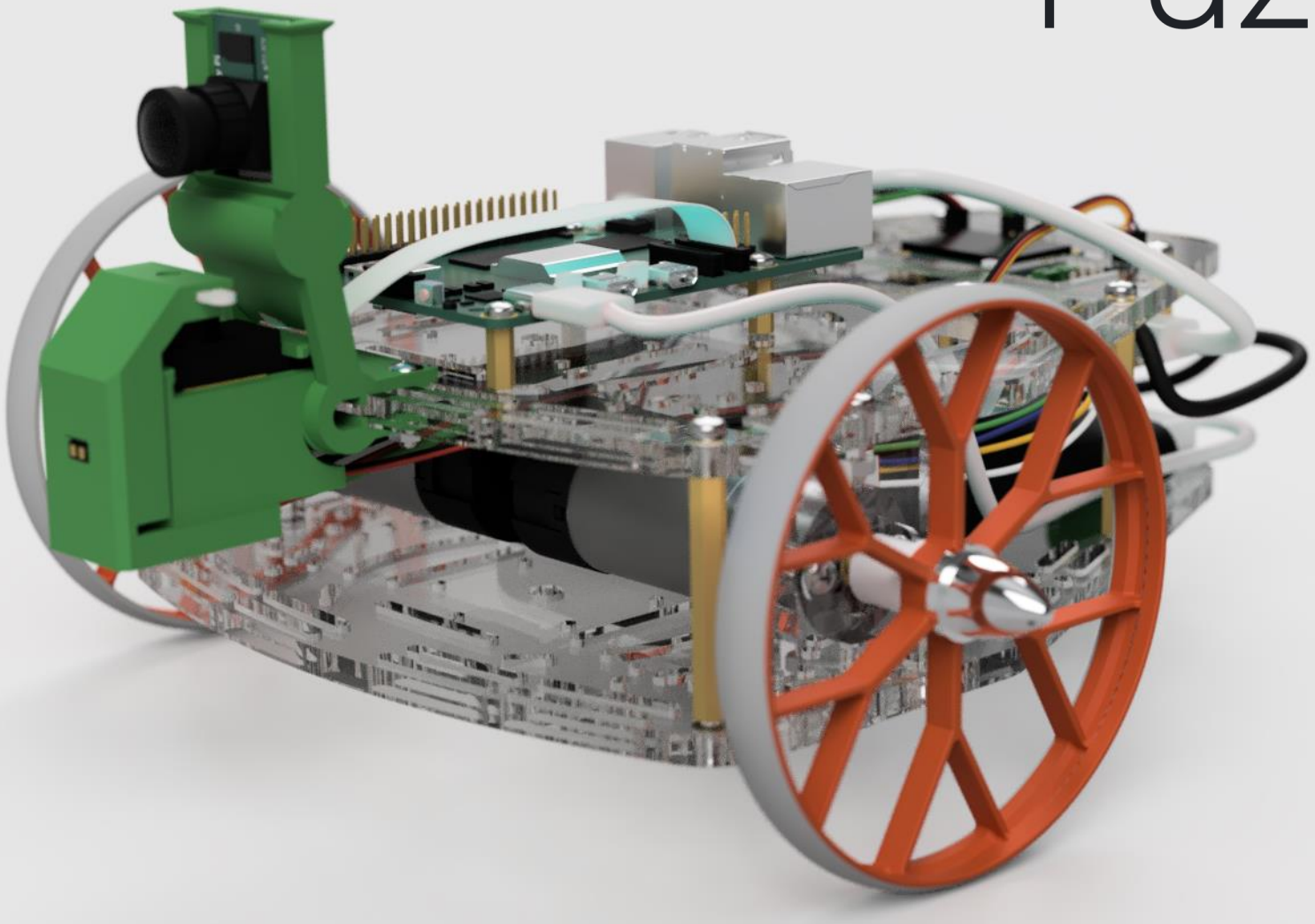
- Charged with an NVIDIA Jetson® Nano / Orin Nano CPU, a Raspberry Pi® Camera and a TOF Sensor.
- Combining the power of the Hackerboard and the NVIDIA JETSON Nano/Orin Nano® allows users to implement research-level, real-time algorithms
- Perfect for AI & Computer Vision, SLAM and autonomous driving algorithms using ROS.



Powered by Raspberry Pi

Puzzlebot

RPi Edition



MCR² Manchester Robotics

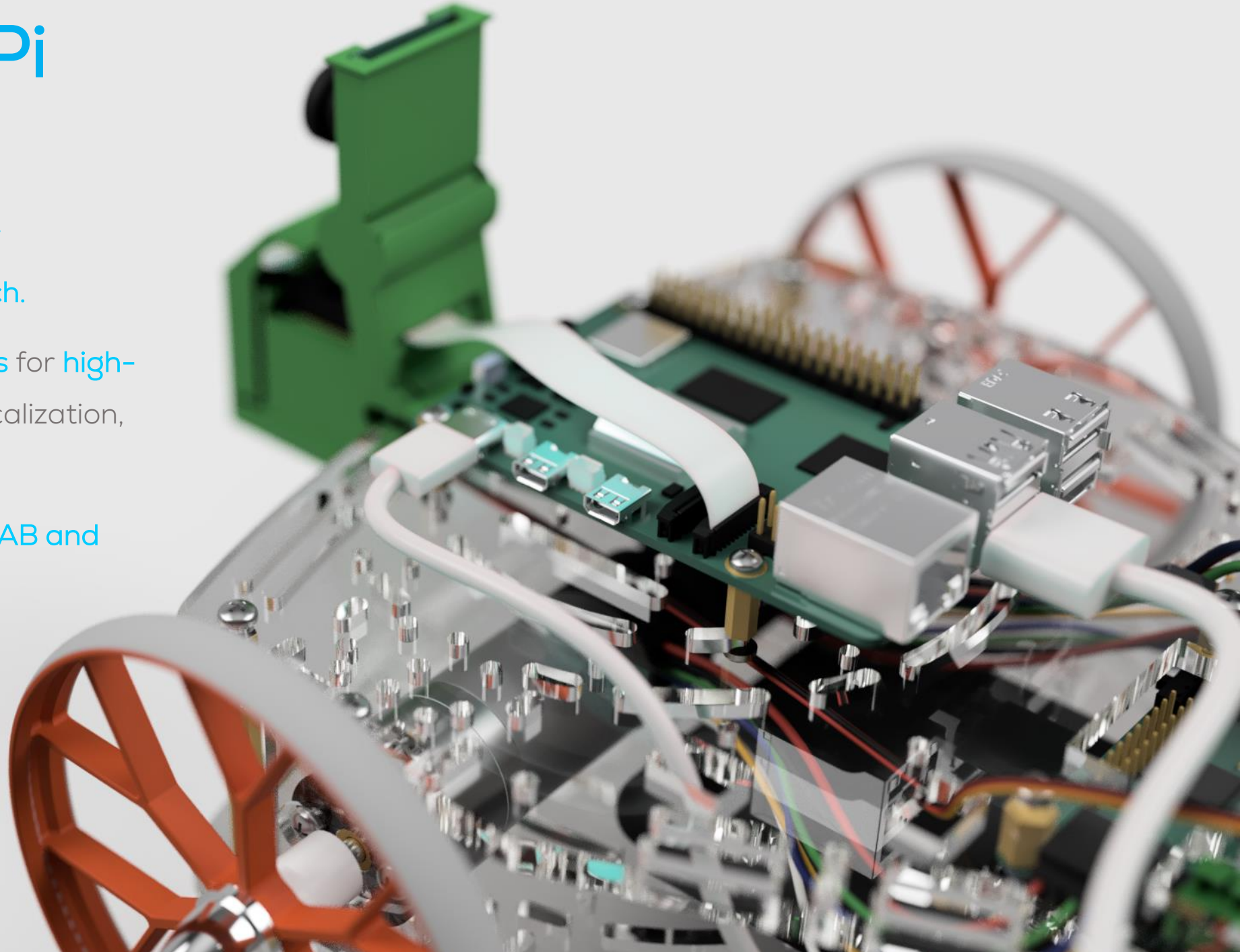
Puzzlebot: RPi Edition

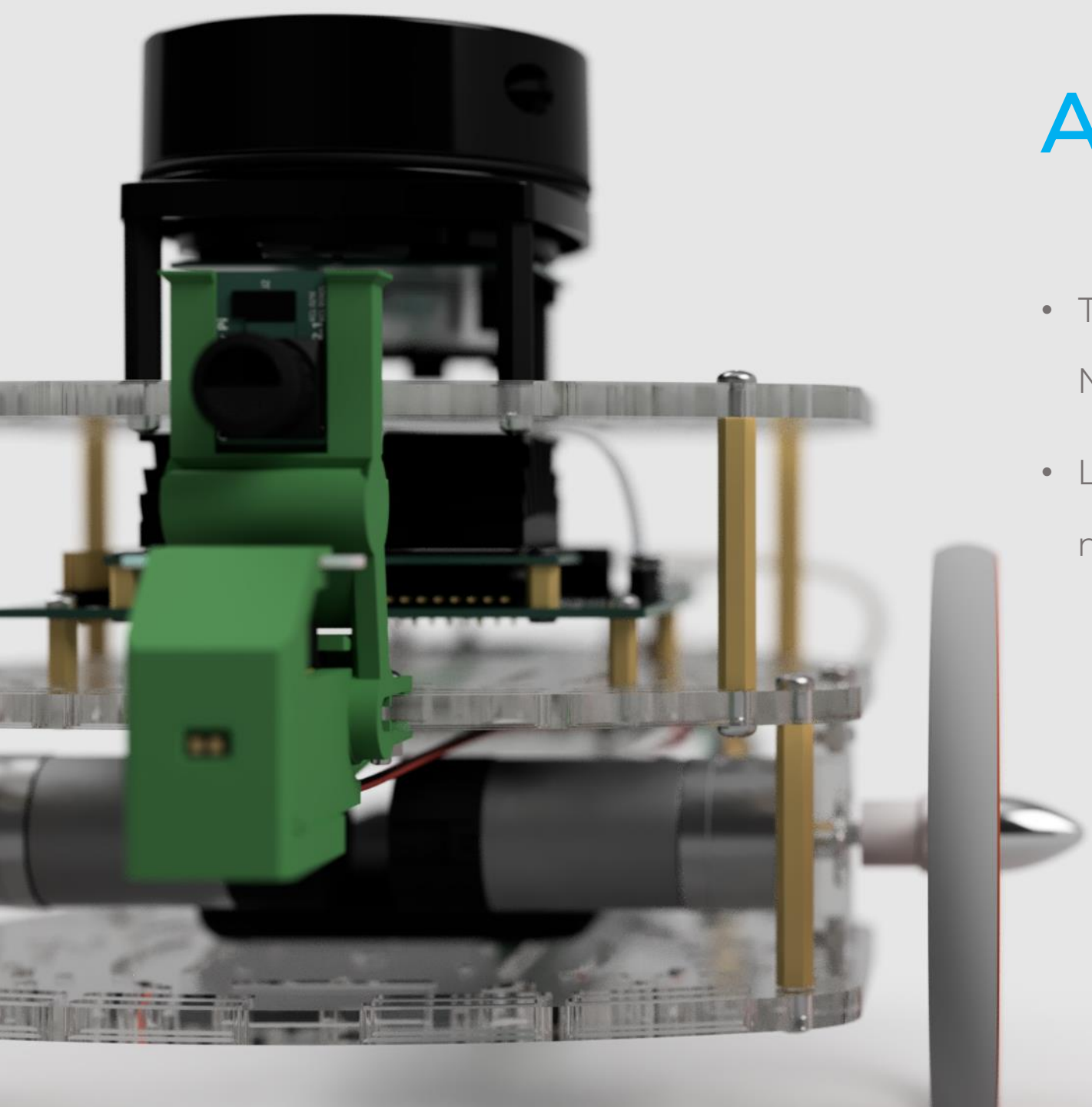
Puzzlebot RPi Edition®

- This edition is powered by the advanced Raspberry Pi 5, offering unmatched versatility and computational power in an affordable and accessible package
- Ideal for beginners and seasoned learners alike, the RPi Edition is designed to bridge the gap between foundational robotics and real-world applications.

Puzzlebot: RPi Edition

- Built around the Raspberry Pi 5.
- Perfect for learning and research.
- Implement advanced algorithms for high-level robotics tasks, including localization, path planning, and navigation.
- Compatible with ROS1/2, MATLAB and LabVIEW.
- Perfect for:
  - AI & Computer Vision,
  - SLAM
  - Autonomous driving.

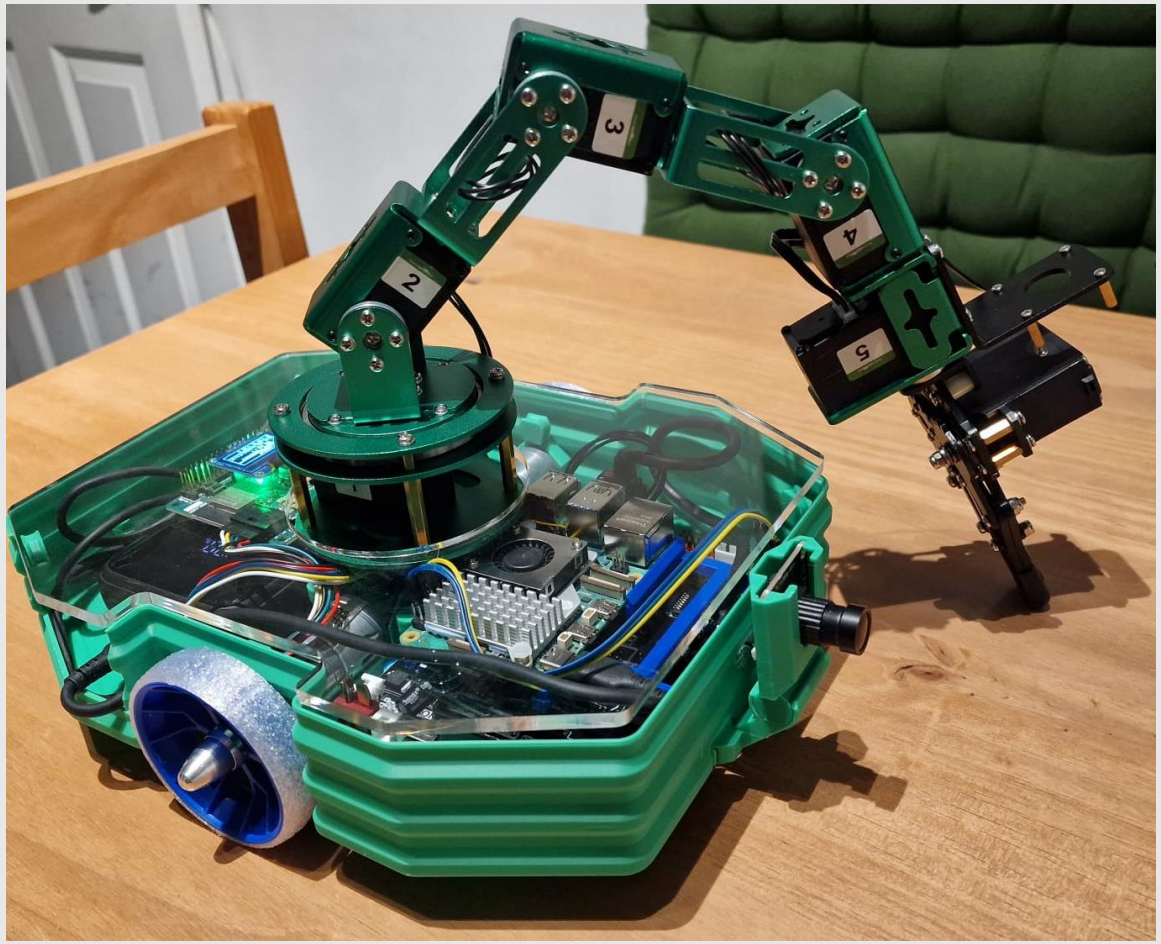




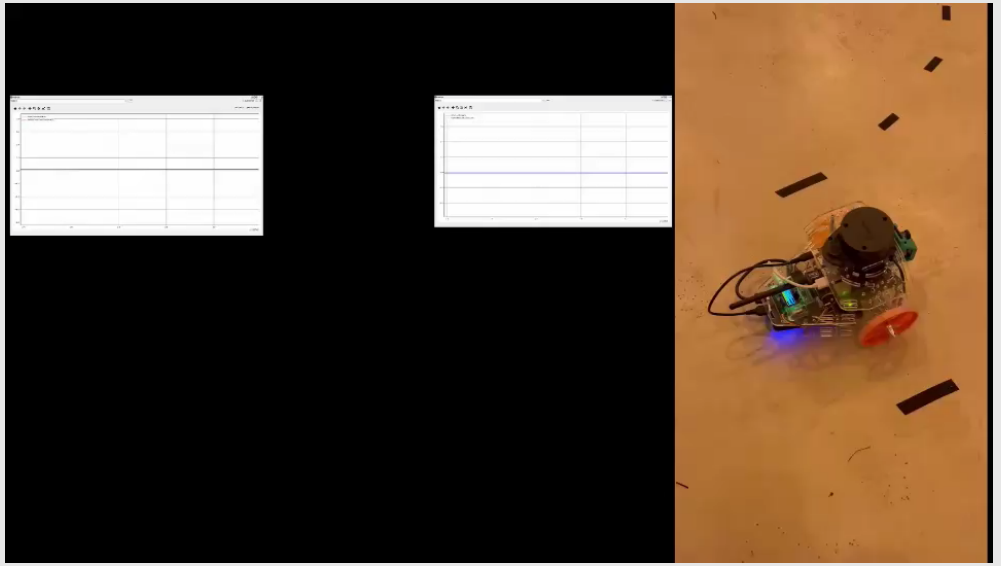
Add-Ons

- The Puzzlebot can be upgraded with different MCR2 Official Add-On sensors.
- LiDAR sensor for advanced mapping and navigation.
  - Add research-level robotics capabilities from SLAM to robust control.
  - The add-on includes the LiDAR sensor, compatible with the RPi./Jetson Editions, and the mounting base.

Expansions



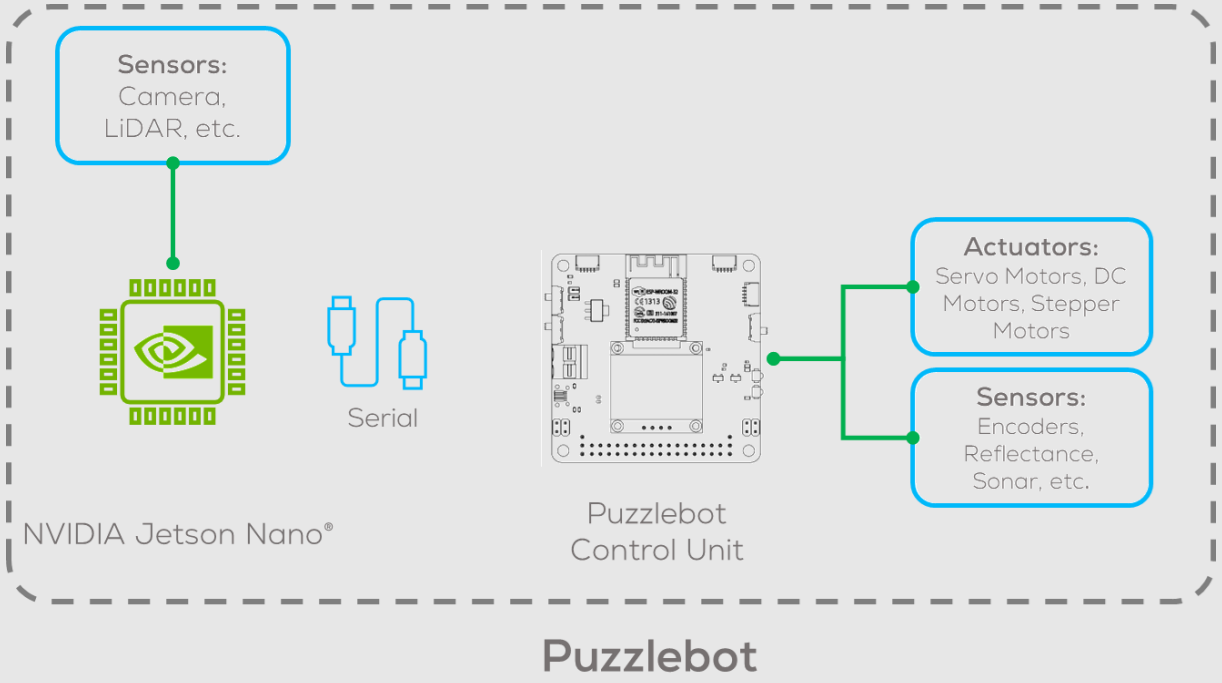
- MCR2 is proud to announce the Puzzlebot Expansions in collaboration with international development robotic companies like “Waveshare”, “SLAMTEC” and “DJI”, in the development of the new robotic platforms and control algorithms.



Puzzlebot: NVIDIA Jetson/RPi Edition

Control Mode: Serial Connection

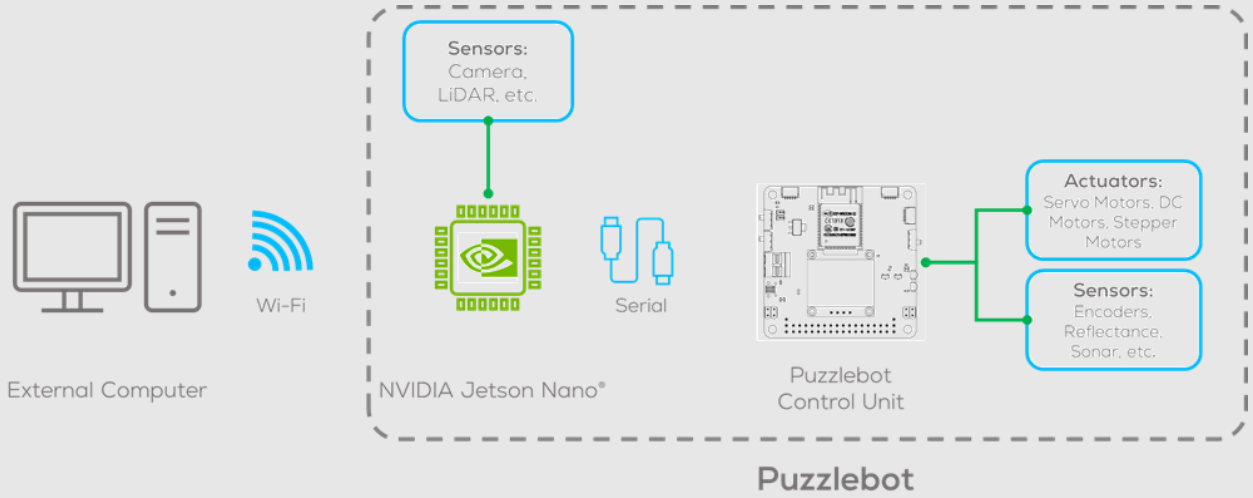
- The user can develop advanced robotic algorithms in ROS (Robot Operating System) using the computing power of the NVIDIA Jetson Nano® or the Rpi 5 and communicate to the actuators and sensors using the Hackerboard.
- The Hackerboard and the Rpi 5/NVIDIA Jetson Nano® are connected via Serial (Communication Libraries with Hackerboard, Sensors and Actuators, provided by MCR2).



Puzzlebot: NVIDIA Jetson/RPi Edition

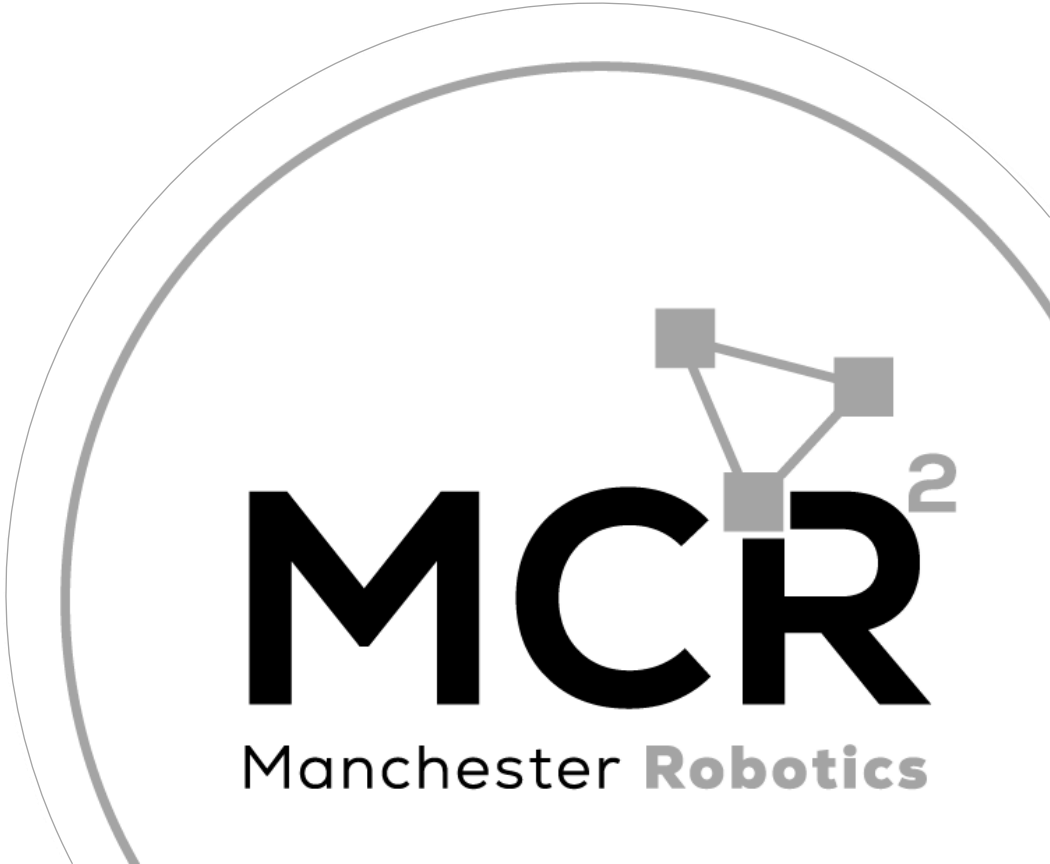
Control Mode: Puzzlebot Client

- In this configuration, the user can connect to the Rpi5/NVIDIA Jetson Nano® to monitor the functionality of the robot, monitor or control a process or simply control the robot wirelessly.
- This configuration works as the previous one, with the difference that, in this case, the user can connect to the External computing unit (ROS Master) via Wi-Fi.



Thank you

{Learn, Create, Innovate};



T&C

Terms and conditions

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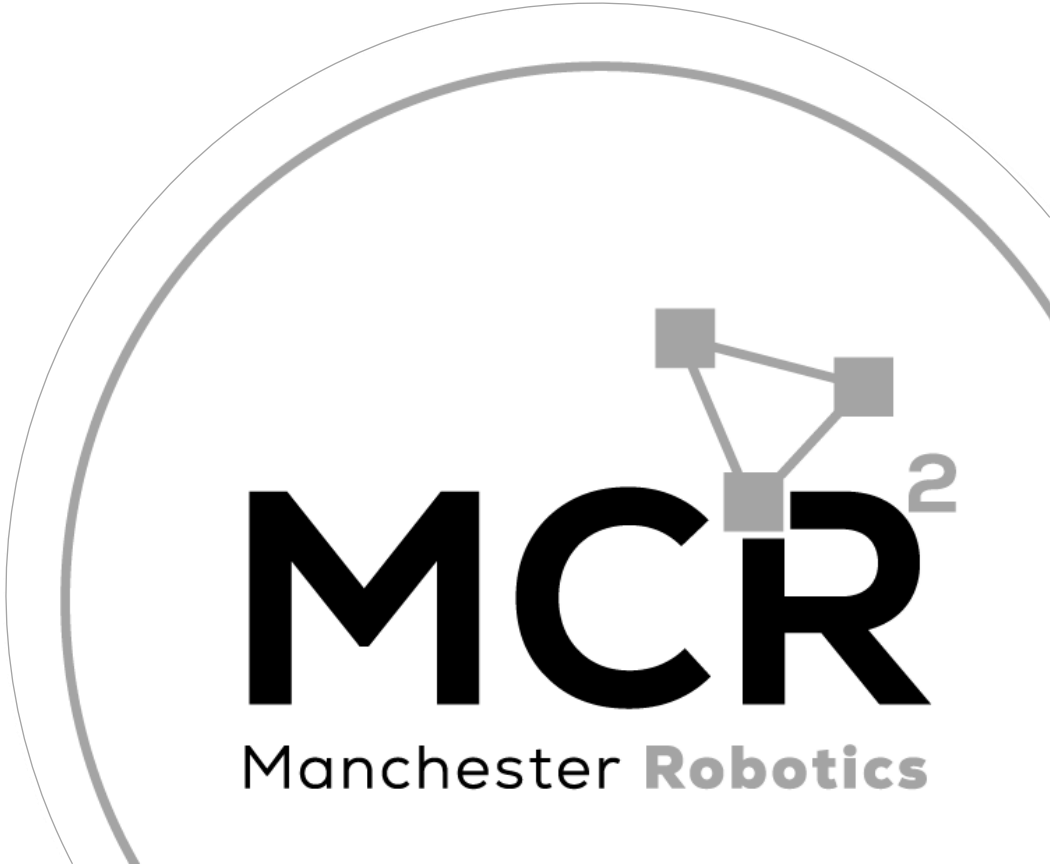

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