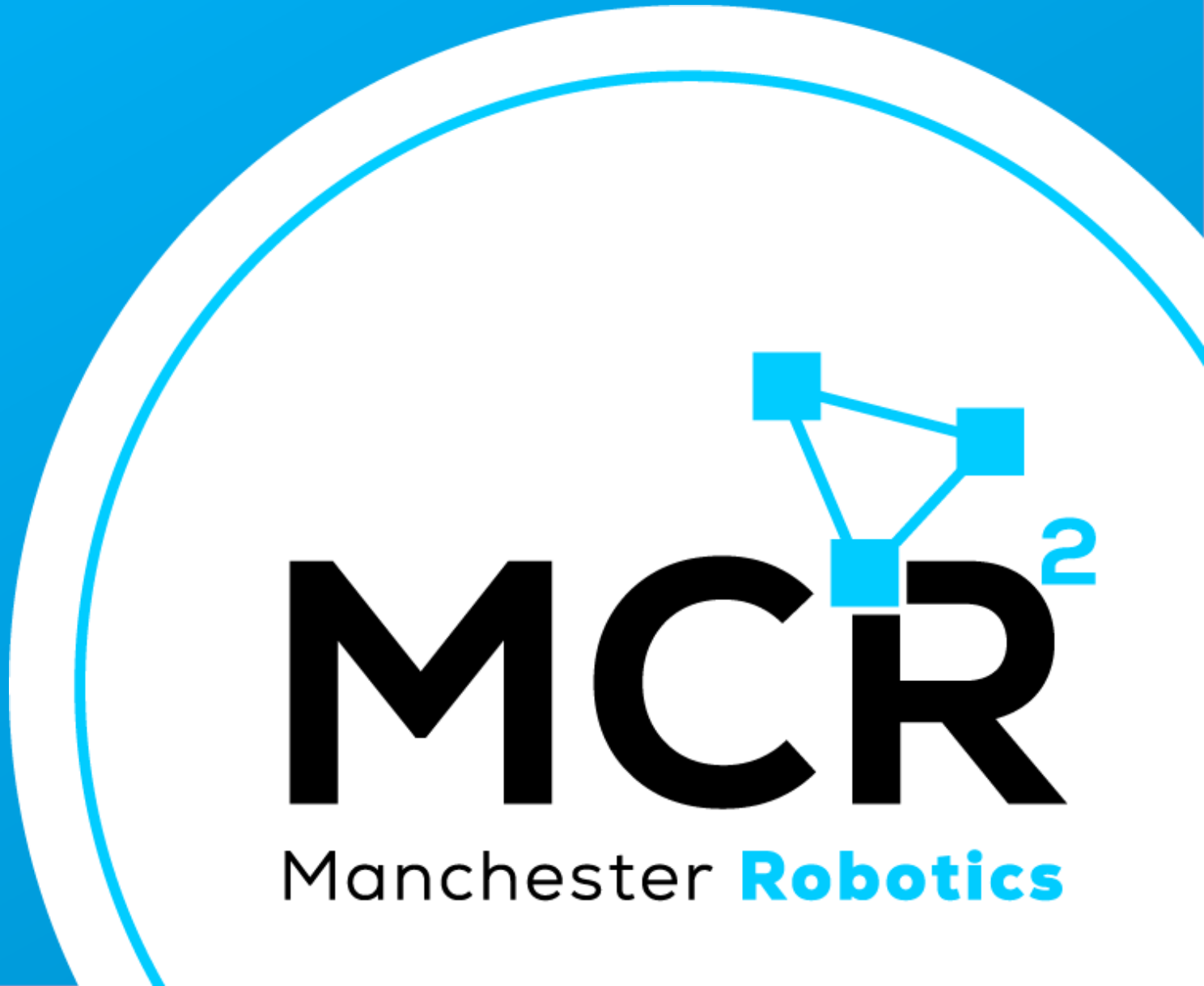
{Learn, Create, Innovate};

Manchester Robotics

Robotics For Everyone

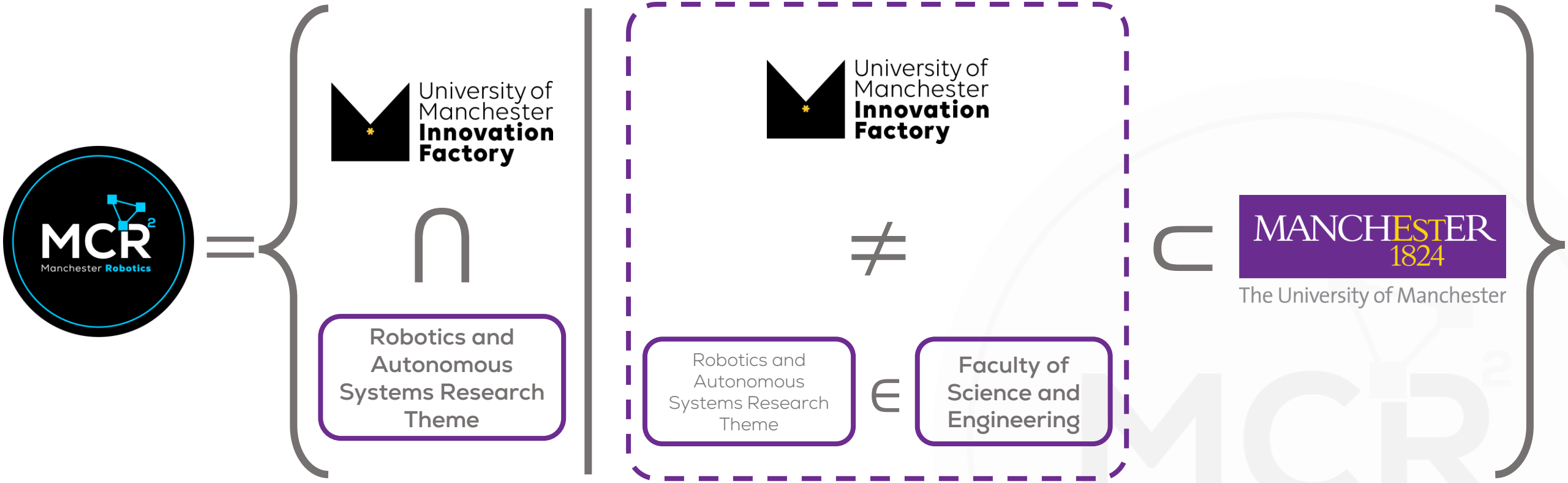


Who are we?

Manchester Robotics Limited is University of Manchester spin-out company.

Born from an initiative of the Robotics Research Group within the Aerospace Research Institute offering development platforms for academic research and education as well as for industrial prototyping.

Where do we come from?

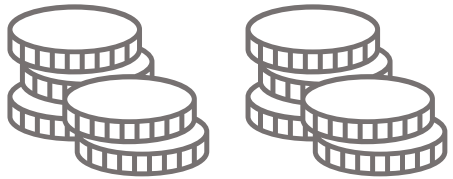


The problem

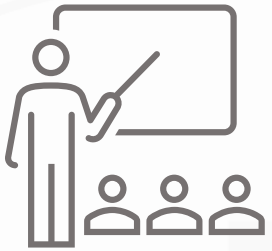
- Primary & secondary sectors of the global economy are rapidly adopting robotics (The World Economic Forum).
- Education systems are failing to meet the demand for robotics-related STEM skills.
- Just in Europe, 10 million plant, machine operator & assembler position are forecast to remain vacant over the next 10 years due to a lack of qualified labour (International Federation of Robotics).

MARKET SECTOR	% OF COMPANIES ADOPTING ROBOTICS IN 2021
Mining & Metals	90%
Advanced Manufacturing	85%
Manufacturing	79%
Oil & Gas	79%
Transportation & Storage	69%
Automotive	60%
Agriculture, Food & Bev	54%

More problems...



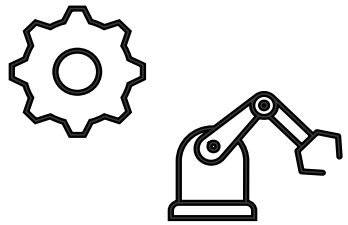
- In higher education there is a limited usage of robotic platforms (only a small number of courses).
- Typically, the cost of each platform >£2000 (only few platforms for 100+ students). Limited open access.
- Limited to work for on-campus labs only. Usually, 1 platform per group of 6-8 students.

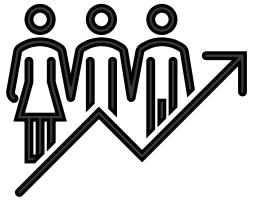


- Do not consider the learning abilities/environments of the students (e.g., not suitable for kinesthetic, auditory and visual students or quieter/shy students).
- Steep learning curves that require weeks of learning to grasp fundamental underlying concepts.
    - Hence, the student only interacts with a high-level, simplified graphical user interfaces.
    - The product is usually a closed system (not to be modified by the students), and only specializing in one single concept increasing the price.
    - This enables rapid user on-boarding, but results in a superficial learning experience and limited functionality.

What do we do?

We create globally-accessible educational tools & curricula for Robotics & Automation





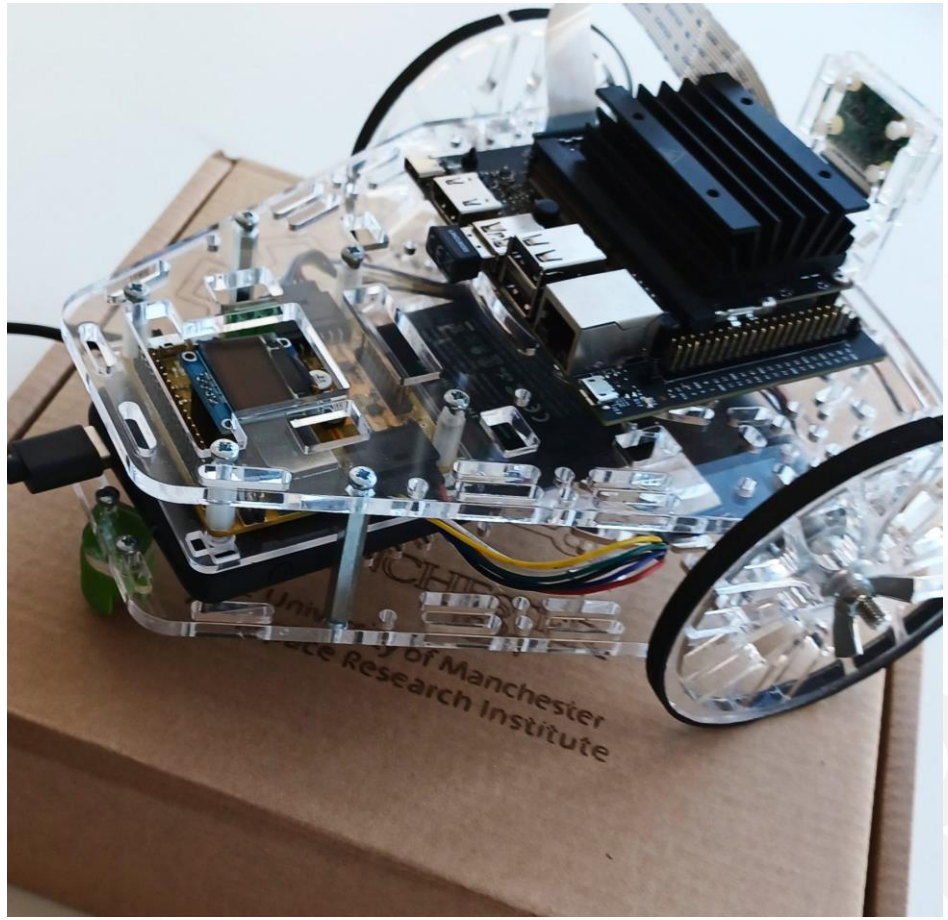
… & providing employers a pipeline of skilled labour

… guiding learners to exciting careers …

> *In a nutshell we provide learners, in whatever manner they want to learn, effectively state of the art courses and a lab in a portable robot.*

What do we want?

- **Solve real problems from industry** – To help primary & secondary sectors of the global economy to rapidly adopting robotics.
- **Robotic democratization** – Provide engineering heroes accessible robotic platforms and help them to reach their potential.
- **Make robotics a net job-creator** – Guide learners to exciting careers & providing employers a pipeline of skilled labour.



Vision & Mission

VISION

Our vision is is to democratize access to skills in Robotics and Automation that will drive future economic growth.

> *"Education is evolving so we need to evolve with it …"*
>
> *Dr Alexandru Stancu, CEO/Director*

MISSION

To disrupt how robotics is currently taught; by combining technology with teaching to provide learners with a deep understanding of robotics theory, and how to apply this to real world problems.

Core values

VALUES

- **Innovation** – To create the world's most advanced educational robot.
- **Applied learning** – To provide the robotics industry with a healthy resource of talent.
- **Availability to all** – To provide access to a robotic platform and courses for everyone (democratise).

> *" For us robotic democratisation is not a concept… its our way of thinking, working… being."*
>
> *Professor Constantinos Soutis, Director*

The team

PROFESSOR CONSTANTINOS SOUTIS

DIRECTOR & CO-FOUNDER

DR ALEXANDRU STANCU

CEO, DIRECTOR & CO-FOUNDER

PHIL KEMP

ADVISOR

DR MARIO MARTINEZ

CTO & CO-FOUNDER

The teaching team

DR ALMA REBECA VELASCO OLMOS

LECTURER

DR MARC FACERIAS

LECTURER

DR KHALID IBRAHIM

LECTURER

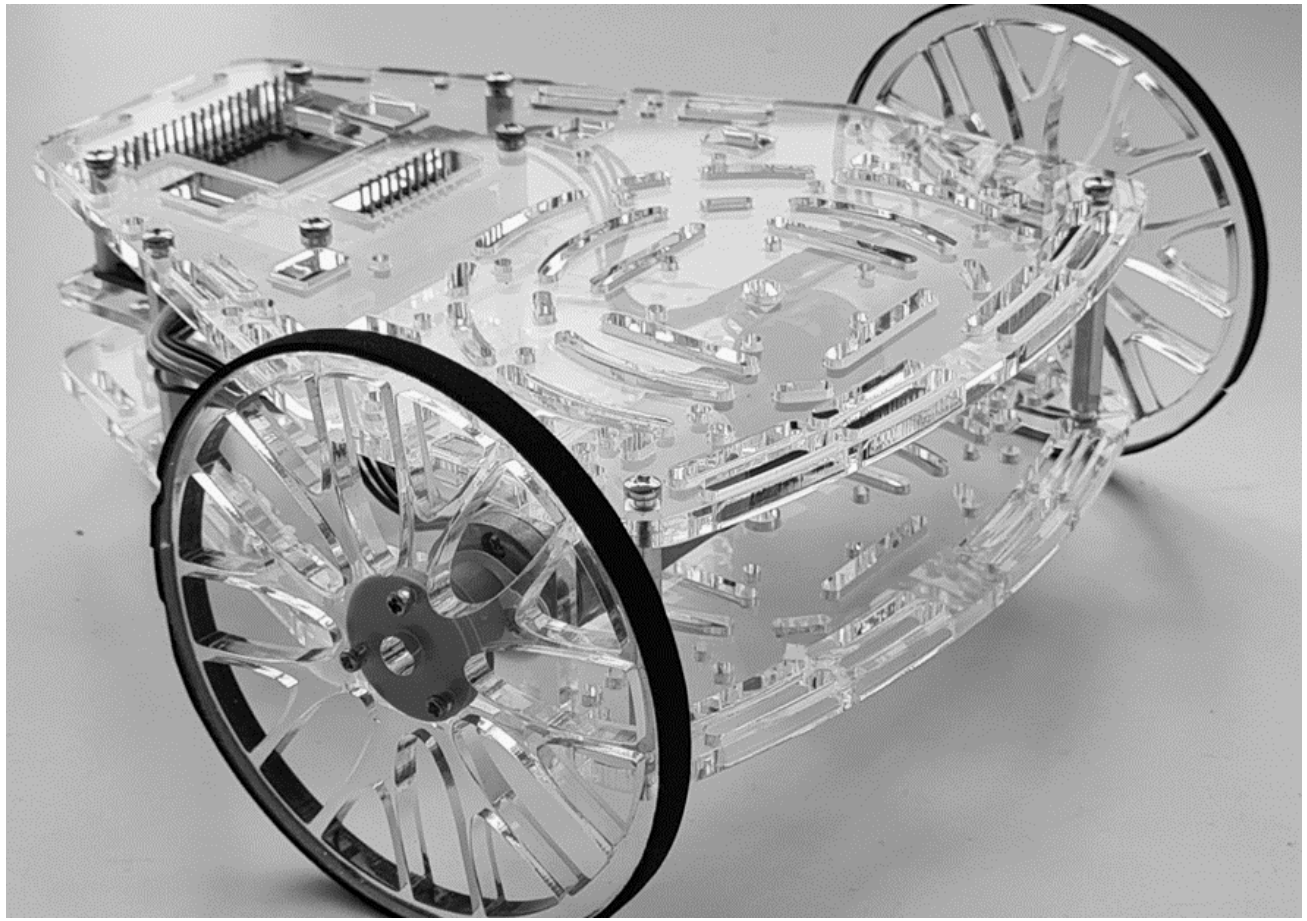
Our solution

- 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 democratization.
- The governing philosophy is that customers are motivated to learn robotics by the appeal of advanced features, which therefore offer far more value than over-simplified proxies with high cost, and limited utility.

Puzzlebot

Our solution

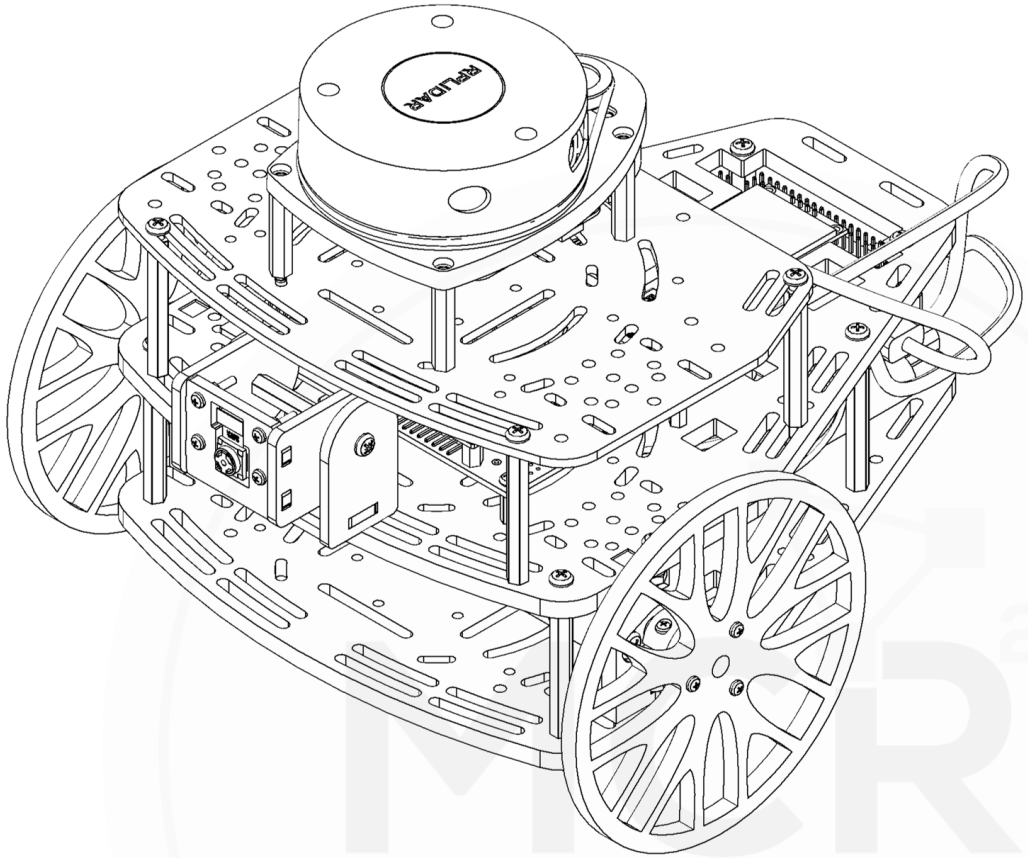
- Puzzlebot is a universal tool for robotics, to help others learn, create, and innovate their own robotic projects.
- The Puzzlebot is a cross-platform, open-source, and plug-and-play mobile robot.
- Capable of accommodating 3rd party off-the-shelf components, thereby keeping unit costs low and democratizing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



Our solution

- Programmable in different languages, catering to learners preferred starting languages.

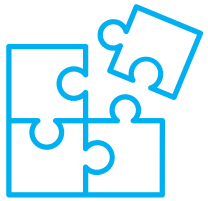
- Provides continuity from entry-level access to research-level functionality to ensure that learners can focus on skill progression rather than constantly being retrained on different robotic platforms.



What makes us different?

Advanced Capability

The circuit board is designed around powerful microprocessors and microcontrollers.

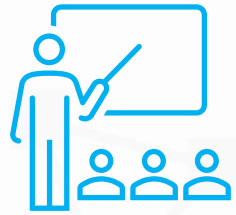


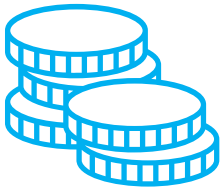
Versatile Feature-set

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.



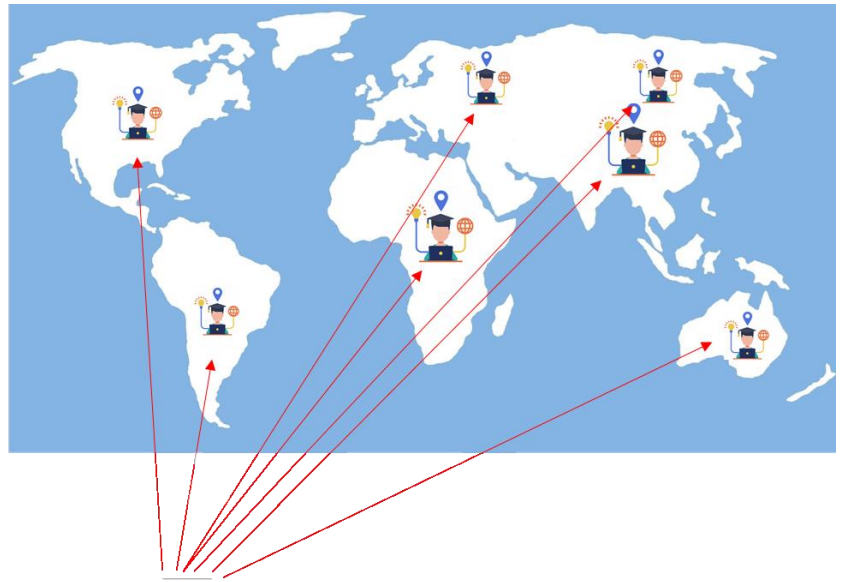


Accessible Price Point

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

Previous experiences

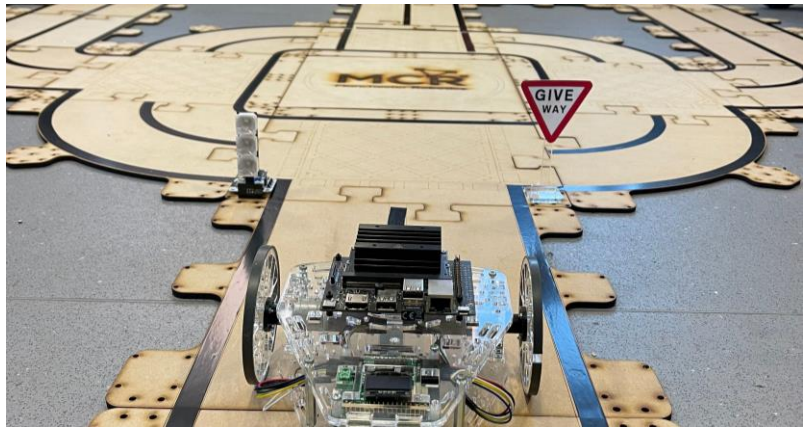
- Manchester Robotics proved itself during lockdown due to the COVID-19 pandemic.
- 300+ units shipped during COVID lockdown.
- Helped students all around the world by providing a lab in a portable robot.
- Design the robotics courses to be implemented in the Puzzlebot in a practical way.
- Accessible, and independent learning tools for key skills in Robotics & Automation.
- Accessible price – Robotic democratization.
- AAA (Anyone, Anytime, Anywhere) Teaching.

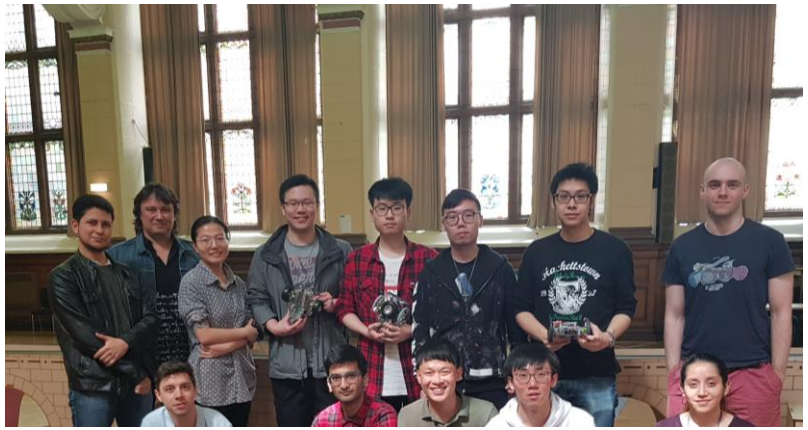


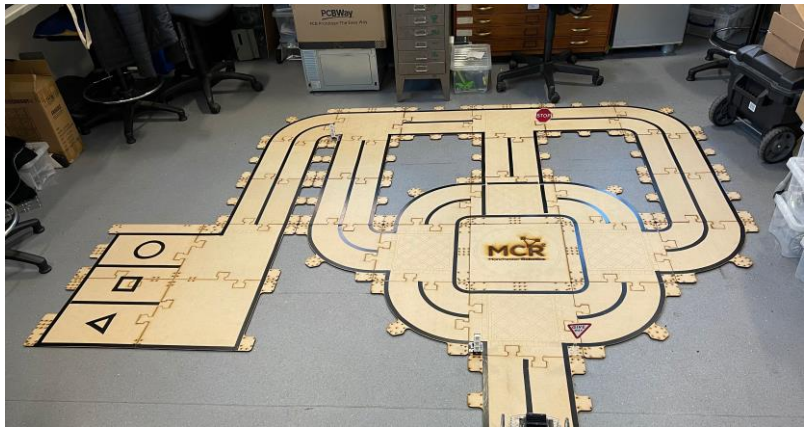
Collaborations

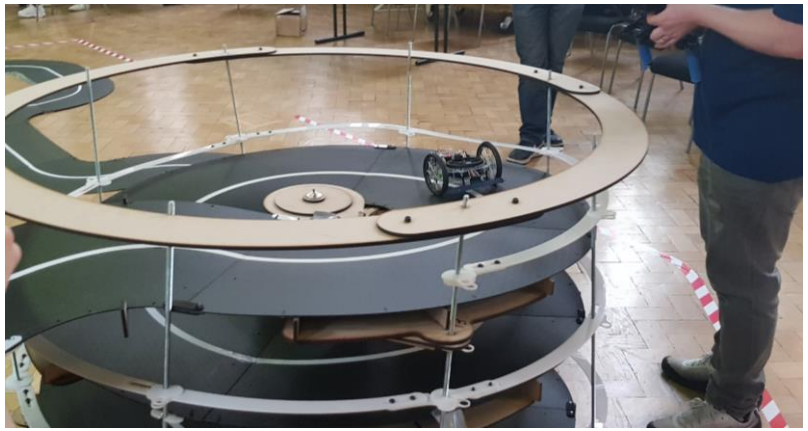
- Close collaboration with NVIDIA for developing robotic platforms and curricula to teach robot vision and AI.
- Close collaboration with Universities around the globe such as University of Manchester, UPC, ENSTA, Tec de Monterrey, UPY and expanding.
- We participated as NVIDIA partner at GTC Conference (NVIDIA GPU Technology Conference) in November 2021.
- Large scale projects
  - Nuclear Industry
  - Defense Industry
  - Textile Industry

Competitions and Challenges





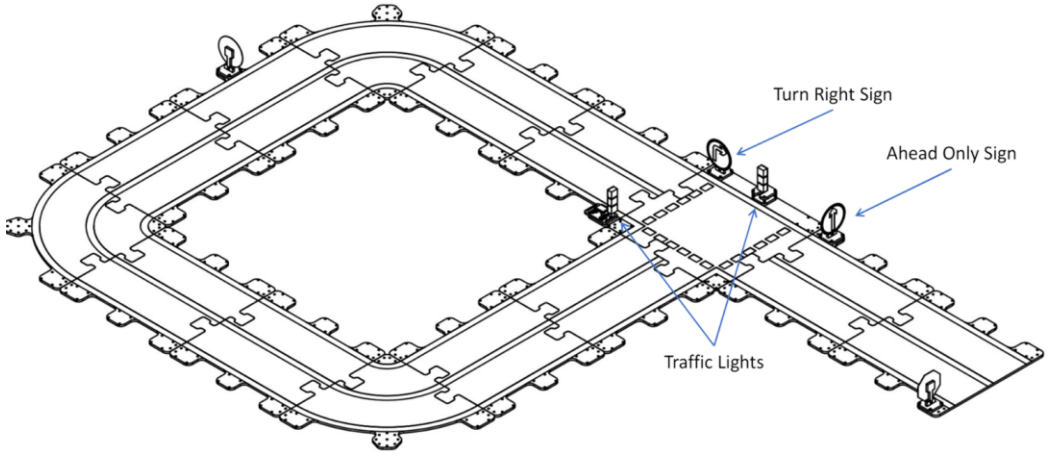


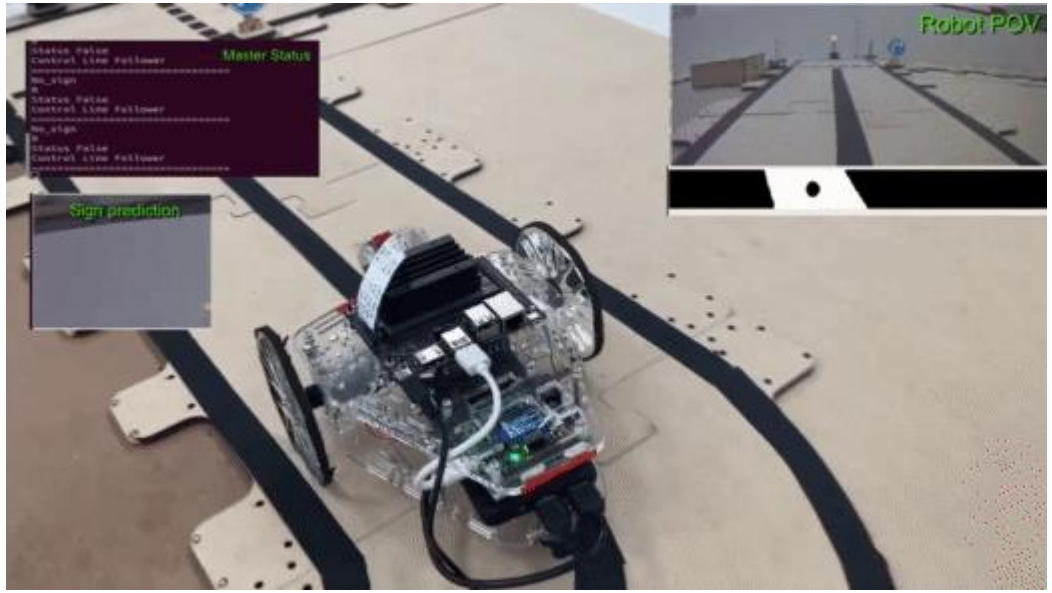


Tec de Monterrey Challenge

- Last year challenge consisted in autonomously drive the robot on a predefined track provided by MCR2.
- Using the knowledge acquired during the semester, the students were able to implement a neural networks alongside some image recognition algorithms and control theory to drive the robot on the track while obeying the traffic signals.
- The best teams got the change exhibit their results to their professors, the directors of MCR2, and the engineering directors at NVIDIA.

Track





Thank You

Robotics For Everyone

{Learn, Create, Innovate};