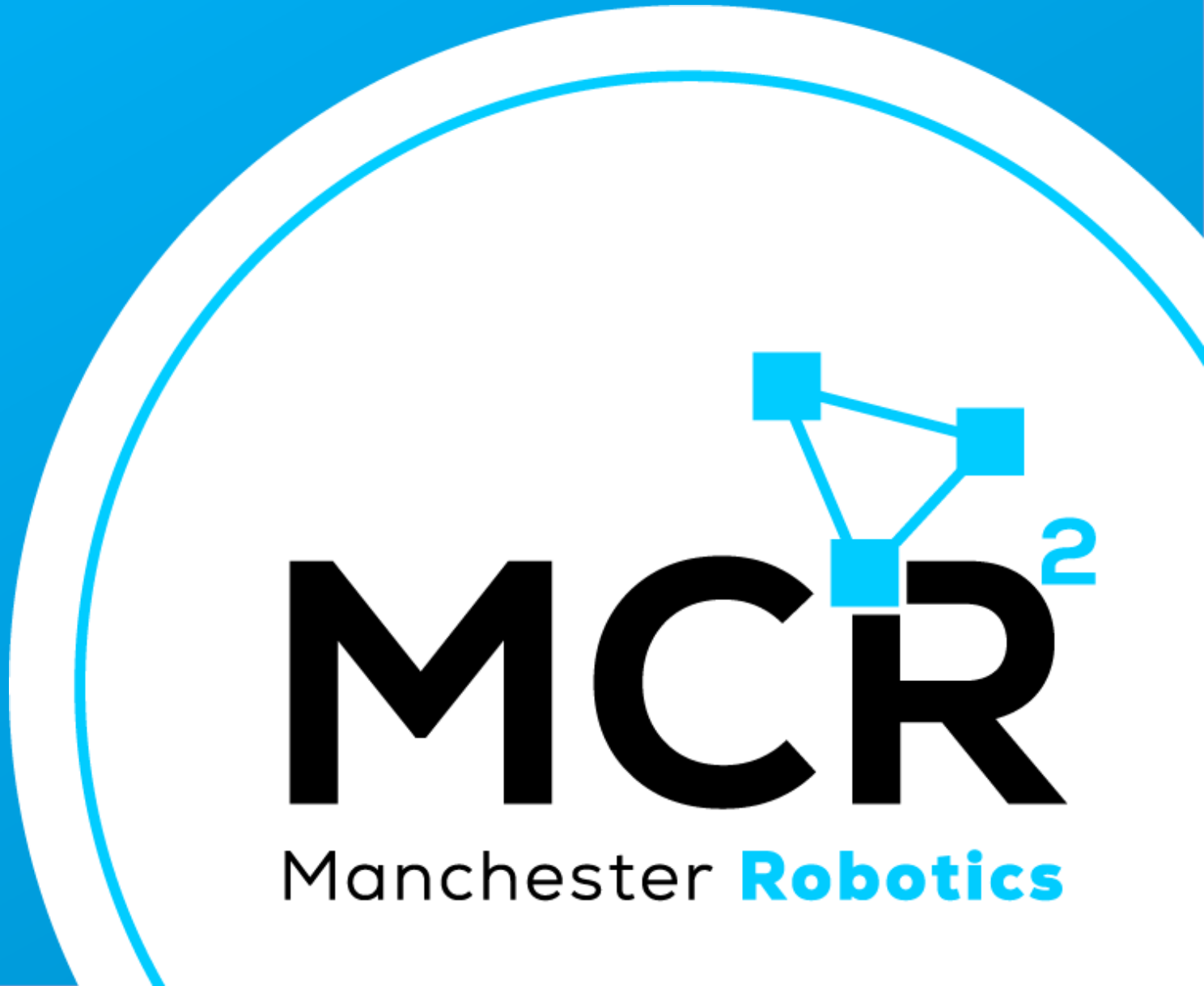
{Learn, Create, Innovate};

Manchester Robotics

Robotics For Everyone

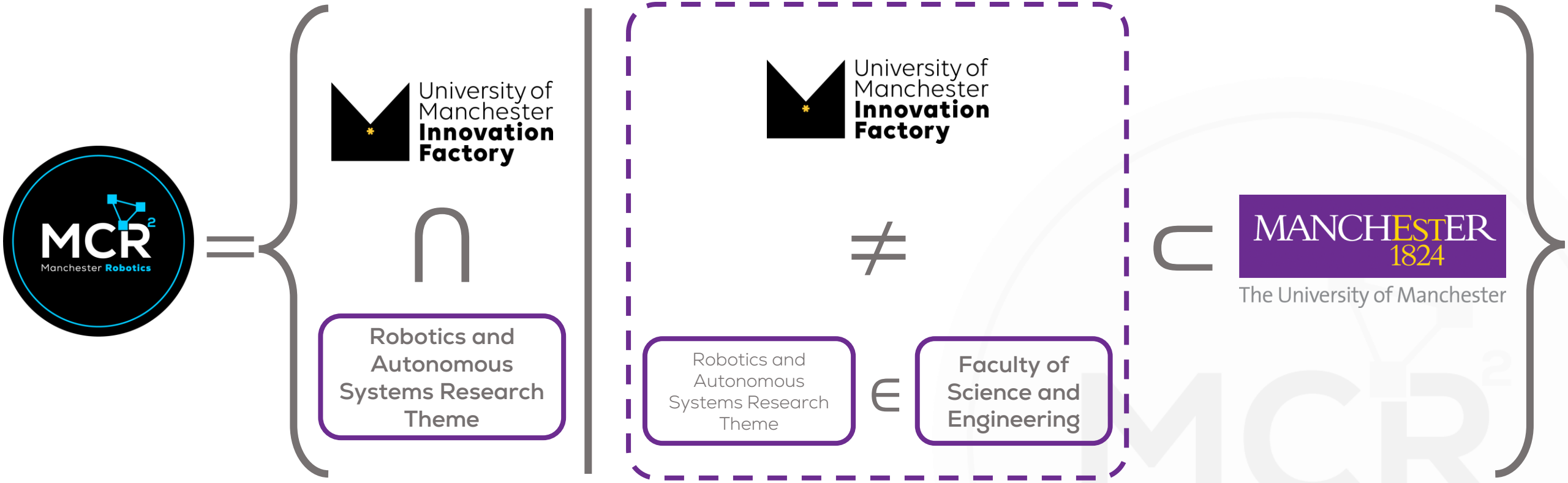


Who are we?

Manchester Robotics Limited was born as a spinout company from The University of Manchester, United Kingdom.

It was 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?

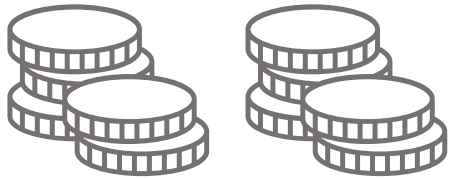


The problem

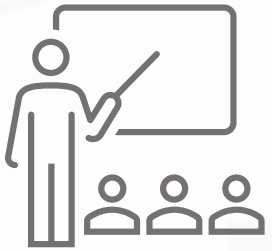
- Primary & secondary sectors of the global economy are rapidly adopting robotics (The World Economic Forum).
- Education systems are failing to meet the demand for robotics-related STEM skills.
- Just in Europe, 10 million plant, machine operator & assembler position are forecast to remain vacant over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



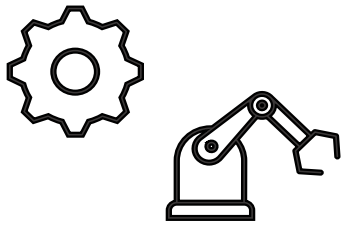
- In higher education there is a limited usage of robotic platforms (only a small number of courses).
- Typically, the cost of each platform >£2000 (only few platforms for 100+ students). Limited open access.
- Limited to work for on-campus labs only. Usually, 1 platform per group of 6-8 students.

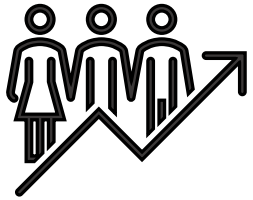


- Do not consider the learning abilities/environments of the students (e.g., not suitable for kinesthetic, auditory and visual students or quieter/shy students).
- Steep learning curves that require weeks of learning to grasp fundamental underlying concepts.
    - Hence, the student only interacts with 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





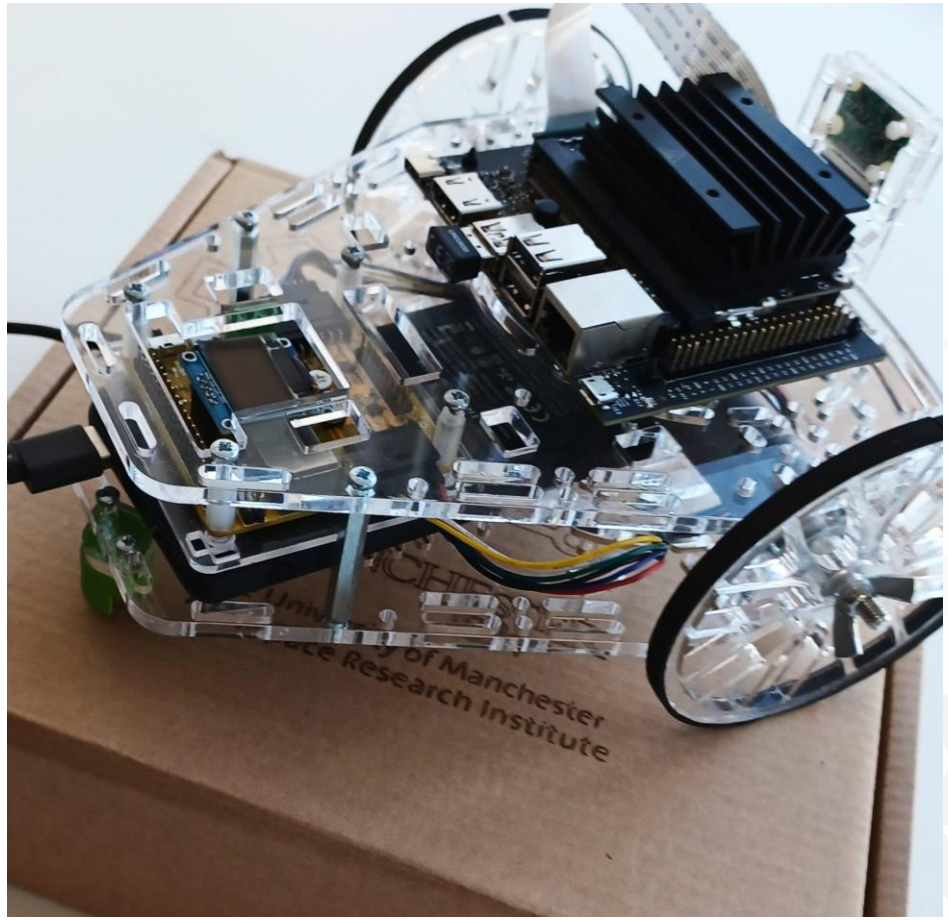
… & providing employers a pipeline of skilled labour

… 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

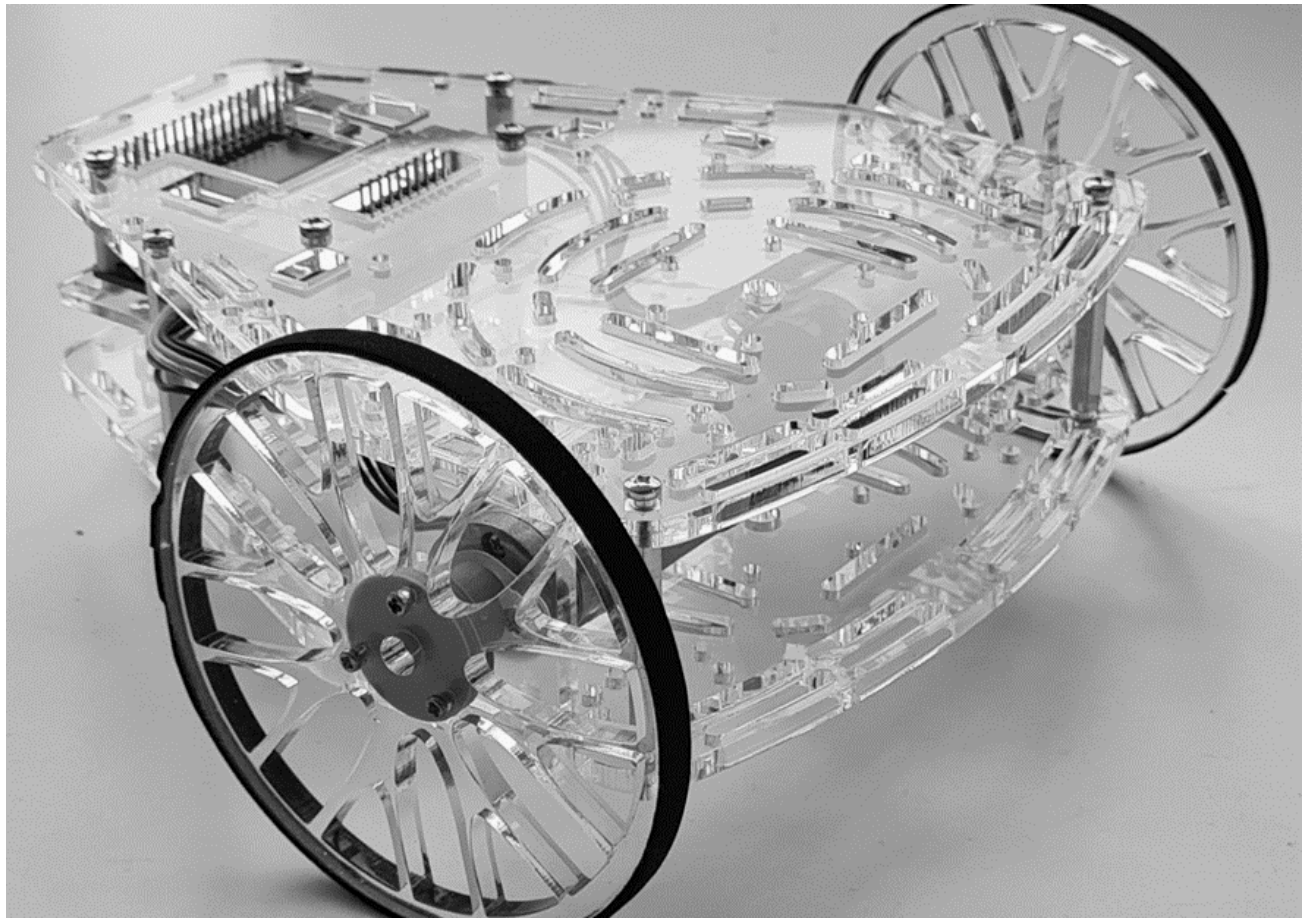
ADVISOR

DR MARIO MARTINEZ

CTO & CO-FOUNDER

Our solution

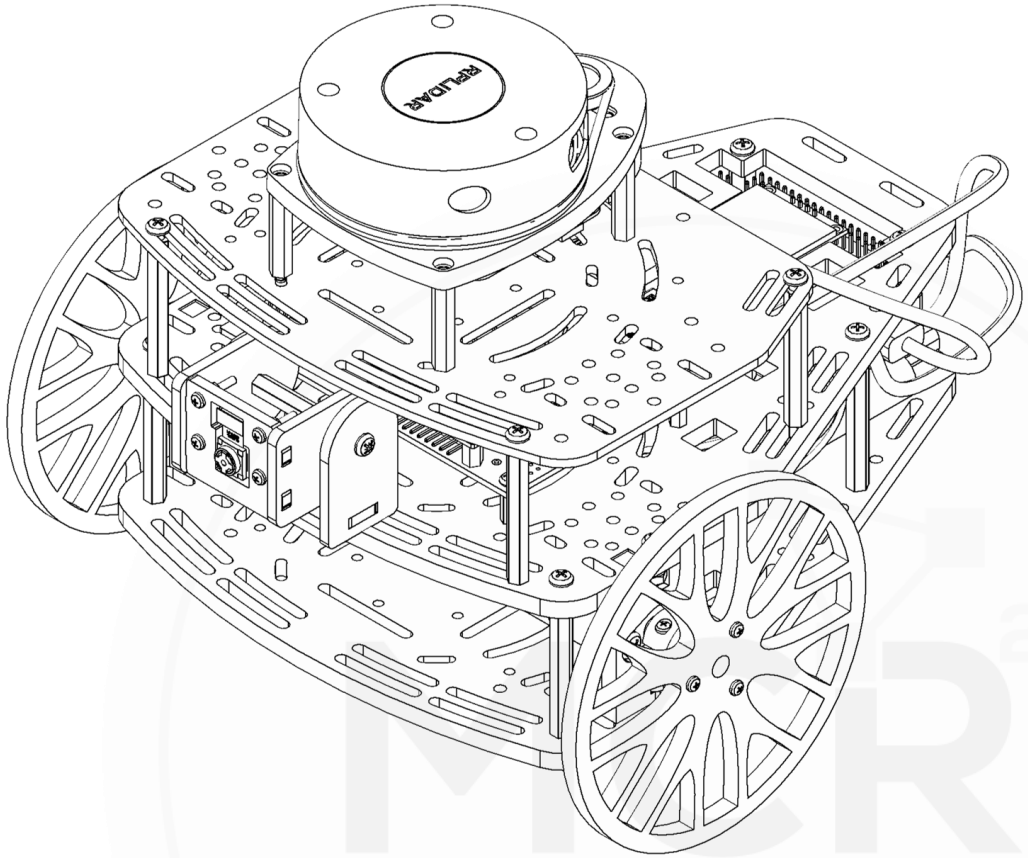
- Puzzlebot is a universal tool for robotics, to help others learn, create, and innovate their own robotic projects.
- The Puzzlebot is a cross-platform, open-source, and plug-and-play mobile robot.
- Capable of accommodating 3rd party off-the-shelf components, thereby keeping unit costs low and democratizing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



Our solution

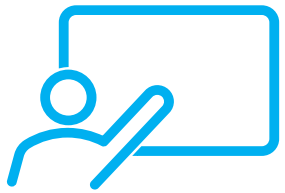
- Programmable in different languages, catering to learners preferred starting languages.

- 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.



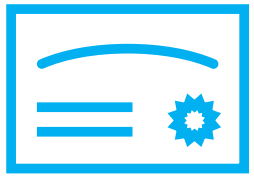
Our Services

Online Courses
Online robotic courses from beginner to advanced level in partnership with NVIDIA.



Synchronous/Asynchronous Teaching
Advanced robotics courses developed alongside our partnership with NVIDIA for Universities (undergrad, postgrad) and High Schools.

Tutor Support (Teach the teachers)
Provide support/update courses for professors, teachers and education professionals worldwide.

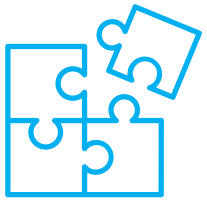


Enterprise/Custom robotic solutions
Robotics consultancy services, custom courses, and advanced robotic platforms to help you meet your goals and earn certification.

What makes us different?

Advanced Capability

Our robotic platform is designed around powerful microprocessors and microcontrollers.

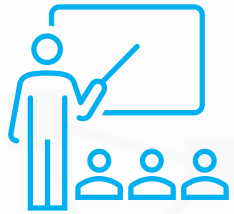


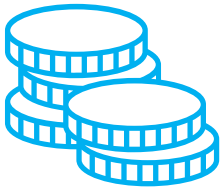
Versatile Feature-set

Our robot and software are designed to be versatile to accommodate add-on components.

Advanced Courses

Advanced robotics courses developed alongside our partnership with NVIDIA.



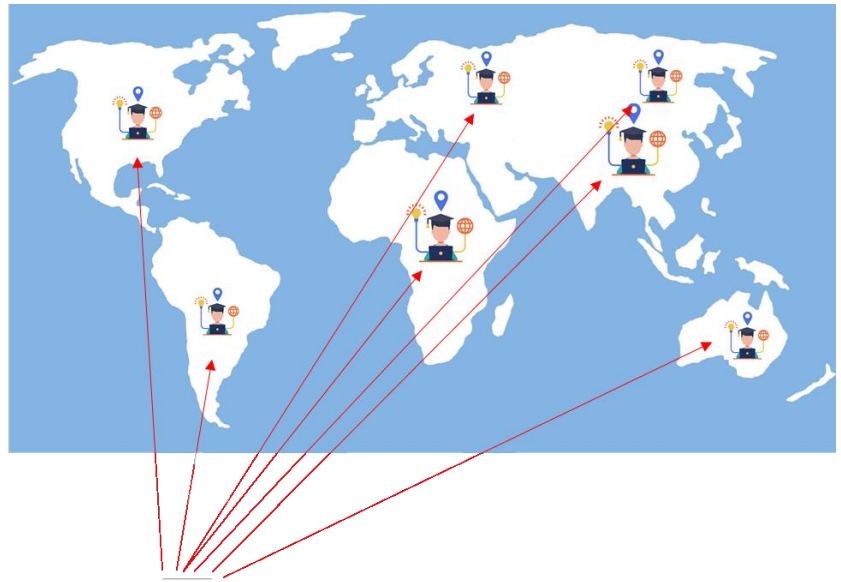


Accessible Price Point

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

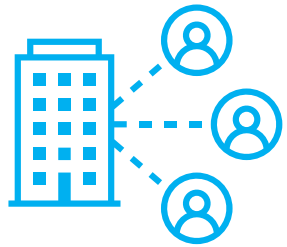
Previous experiences

- 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



Some of our clients

Sellafield Ltd

The University of Manchester

Durham University

Tecnológico de Monterrey

ohm Technische Hochschule Nürnberg

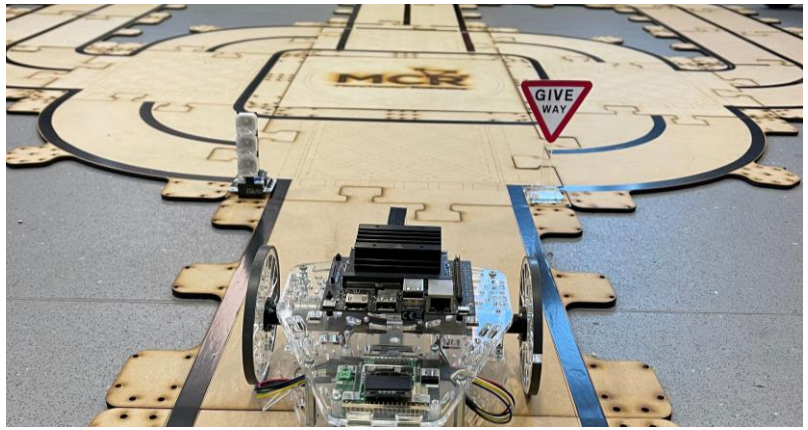
Aston University BIRMINGHAM UK

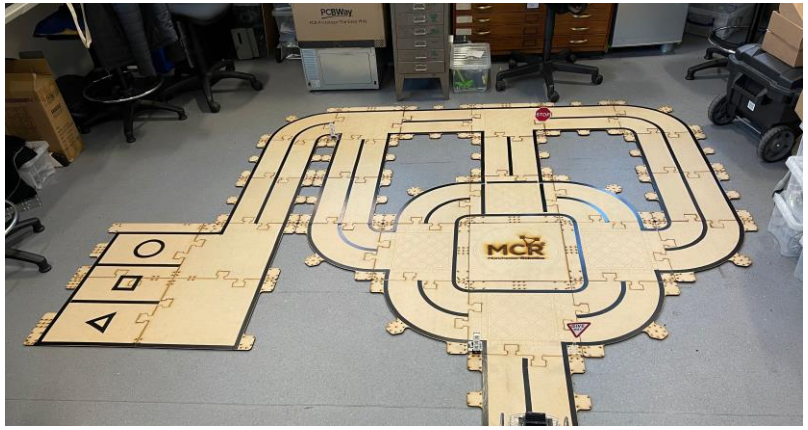
UPY BIS

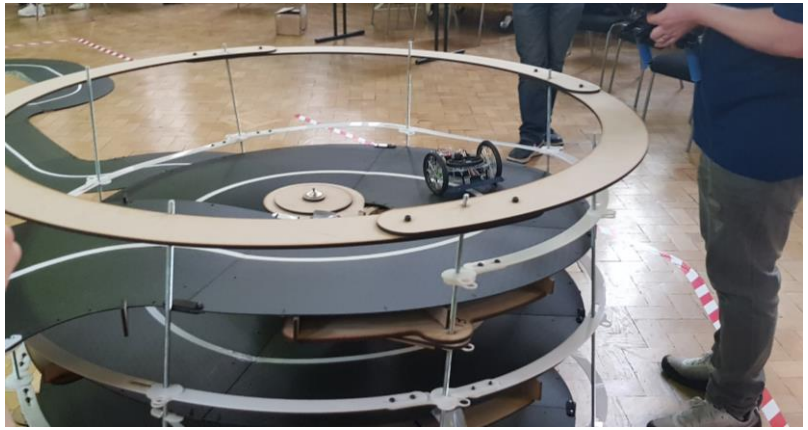
UNI GRAZ

UPC UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

Competitions and Challenges



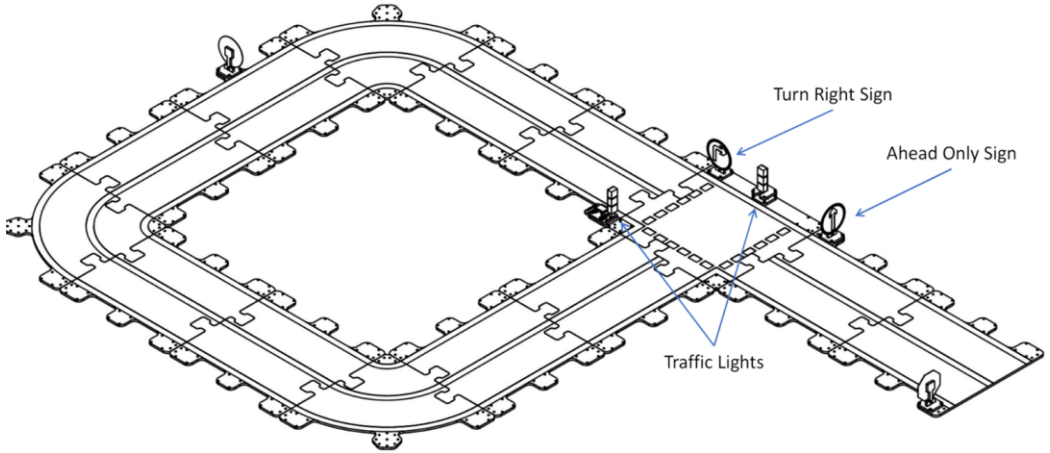


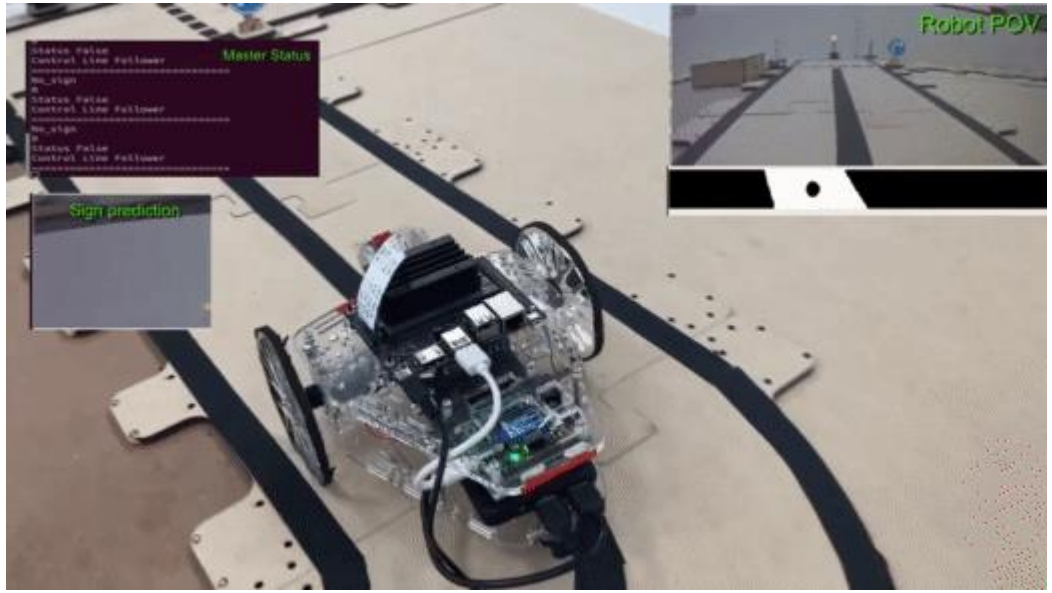


Tec de Monterrey Challenge

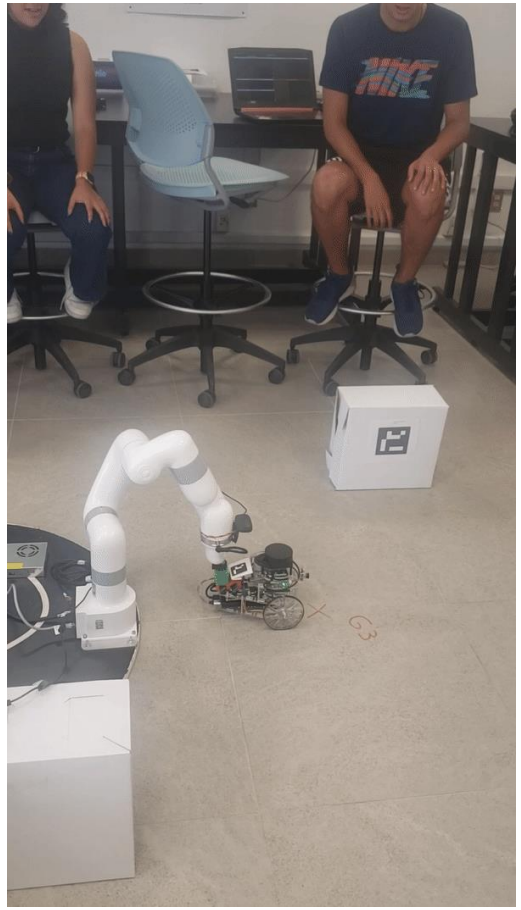
- Last year challenge consisted in autonomously drive the robot on a predefined track provided by MCR2.
- Using the knowledge acquired during the semester, the students were able to implement a neural networks alongside some image recognition algorithms and control theory to drive the robot on the track 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.

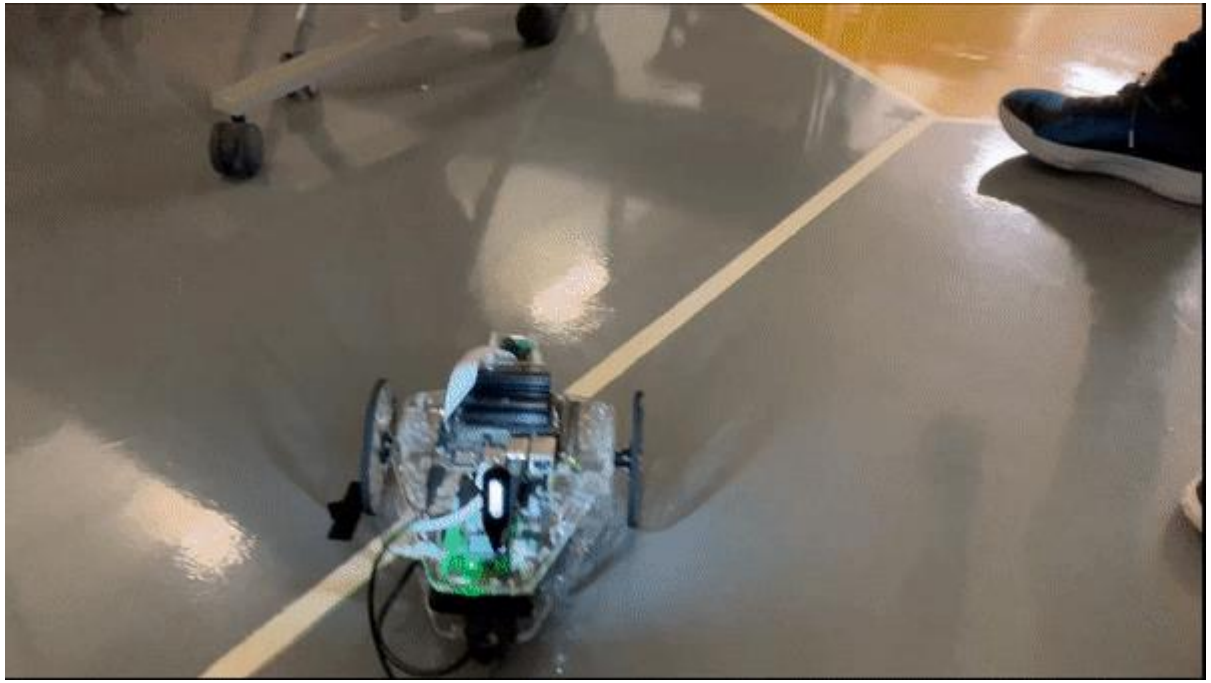
Track





Tec de Monterrey Minichalenge

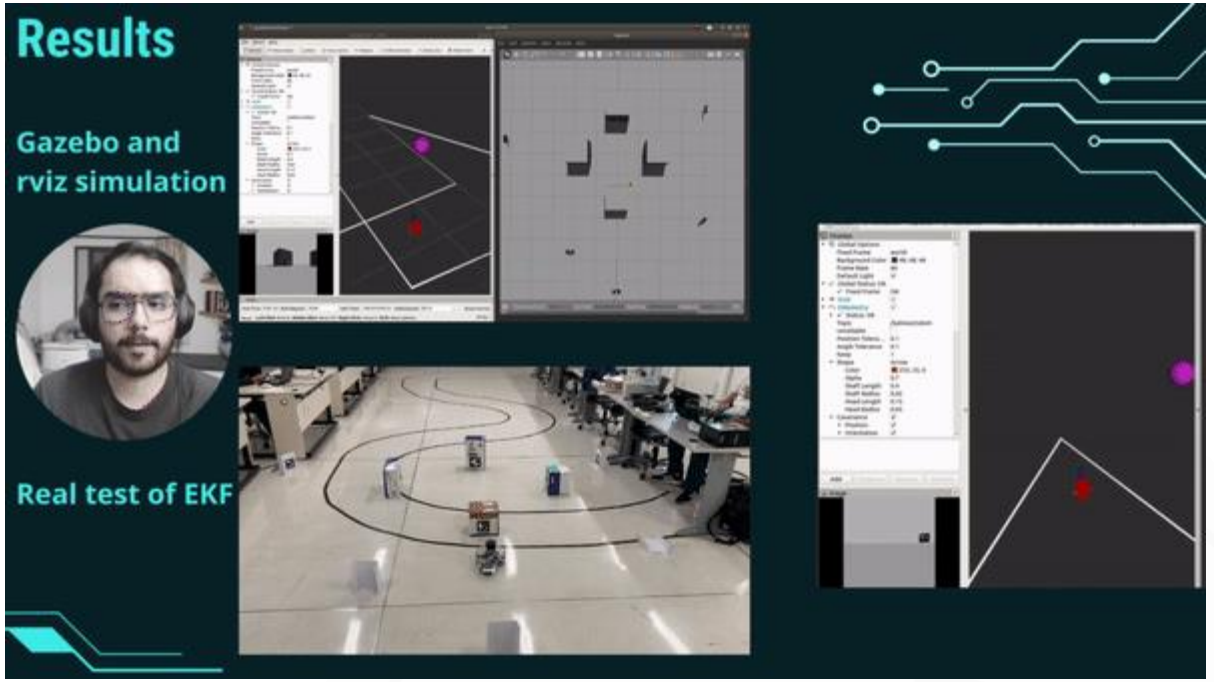


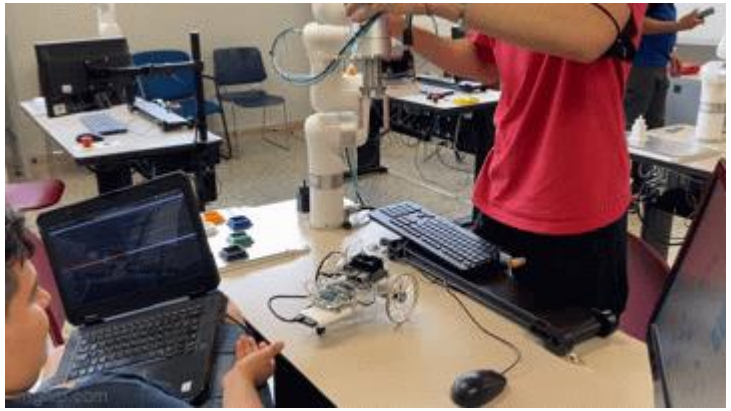



MANCHESTER
1824
The University of Manchester
Last day at
UNIVERSITY OF MANCHESTER


A digital twin of the
UNIVERSITY OF MANCHESTER
for NVIDIA Isaac Sim


Video...
imgflip.com

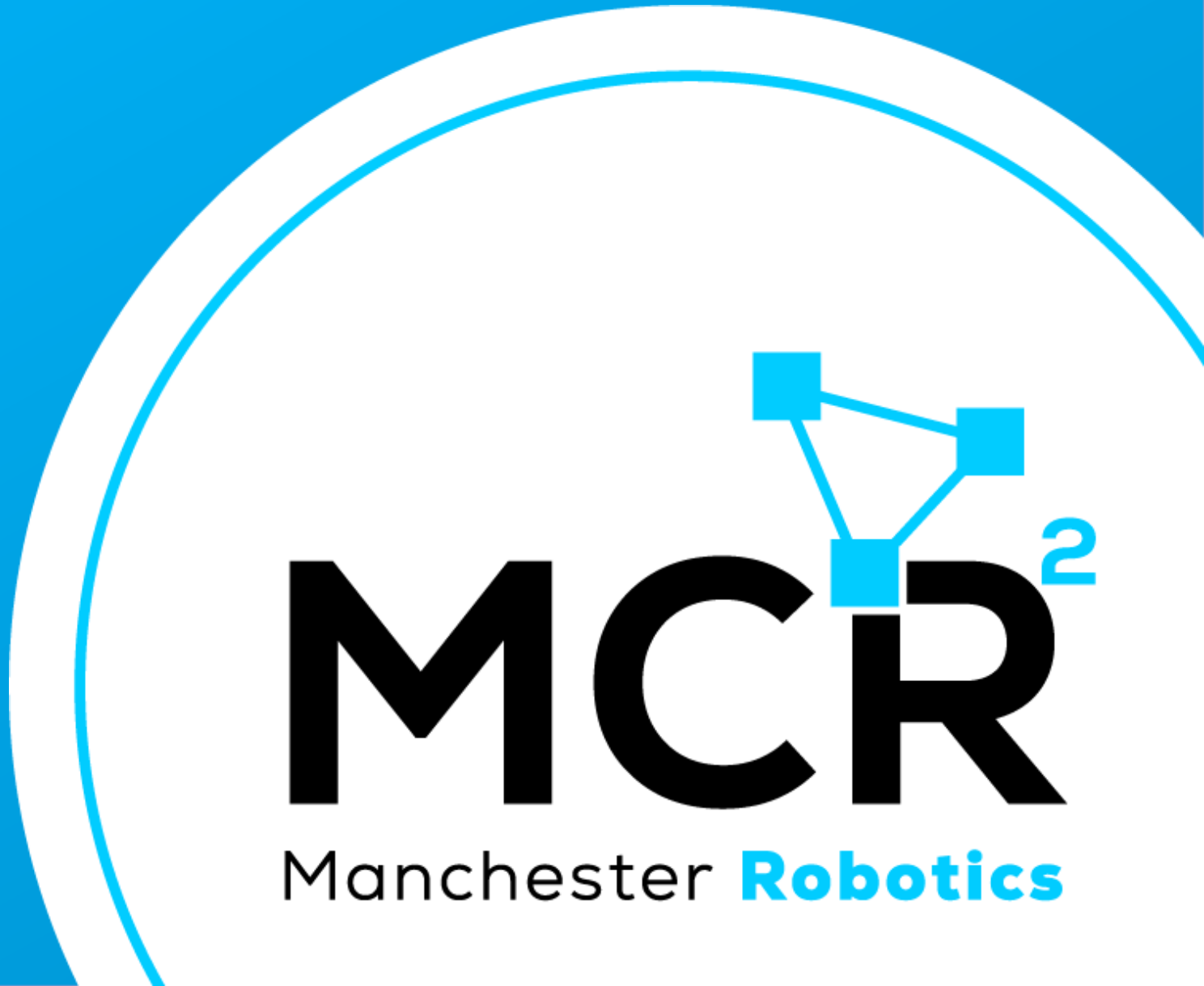

Results
Gazebo and
rviz simulation
Real test of EKF



Thank You

Robotics For Everyone

{Learn, Create, Innovate};



T&C

Terms and conditions

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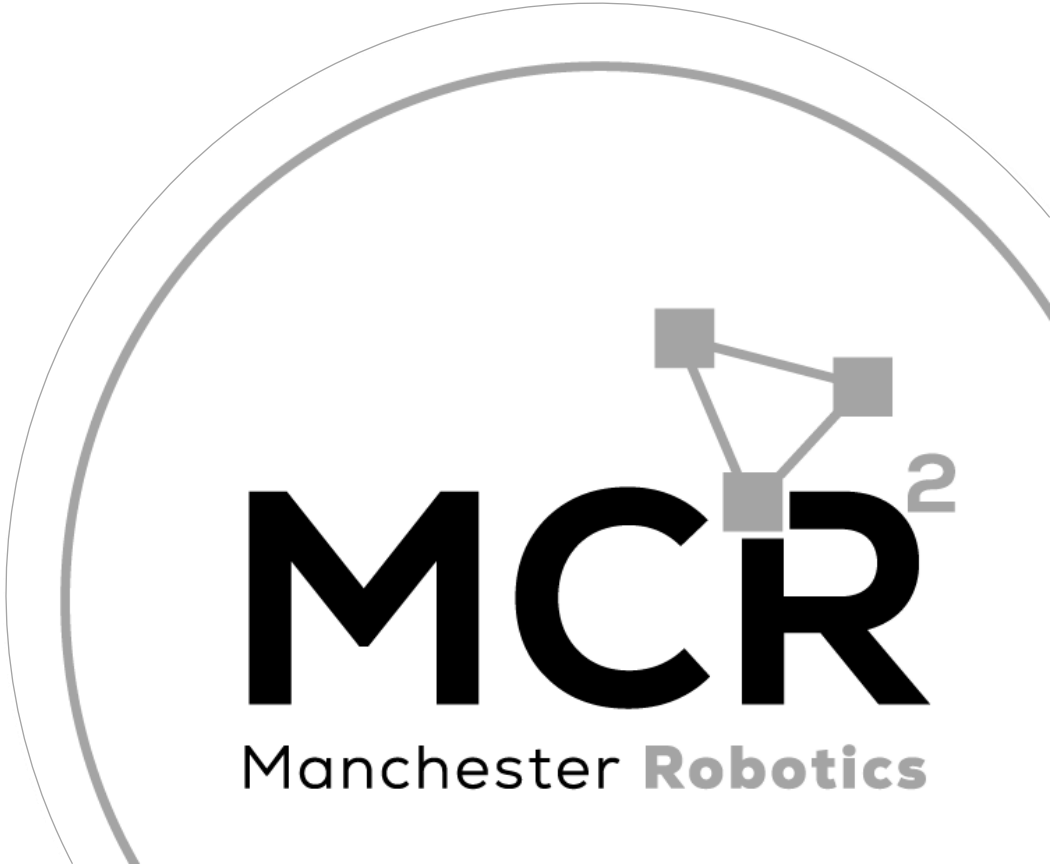

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