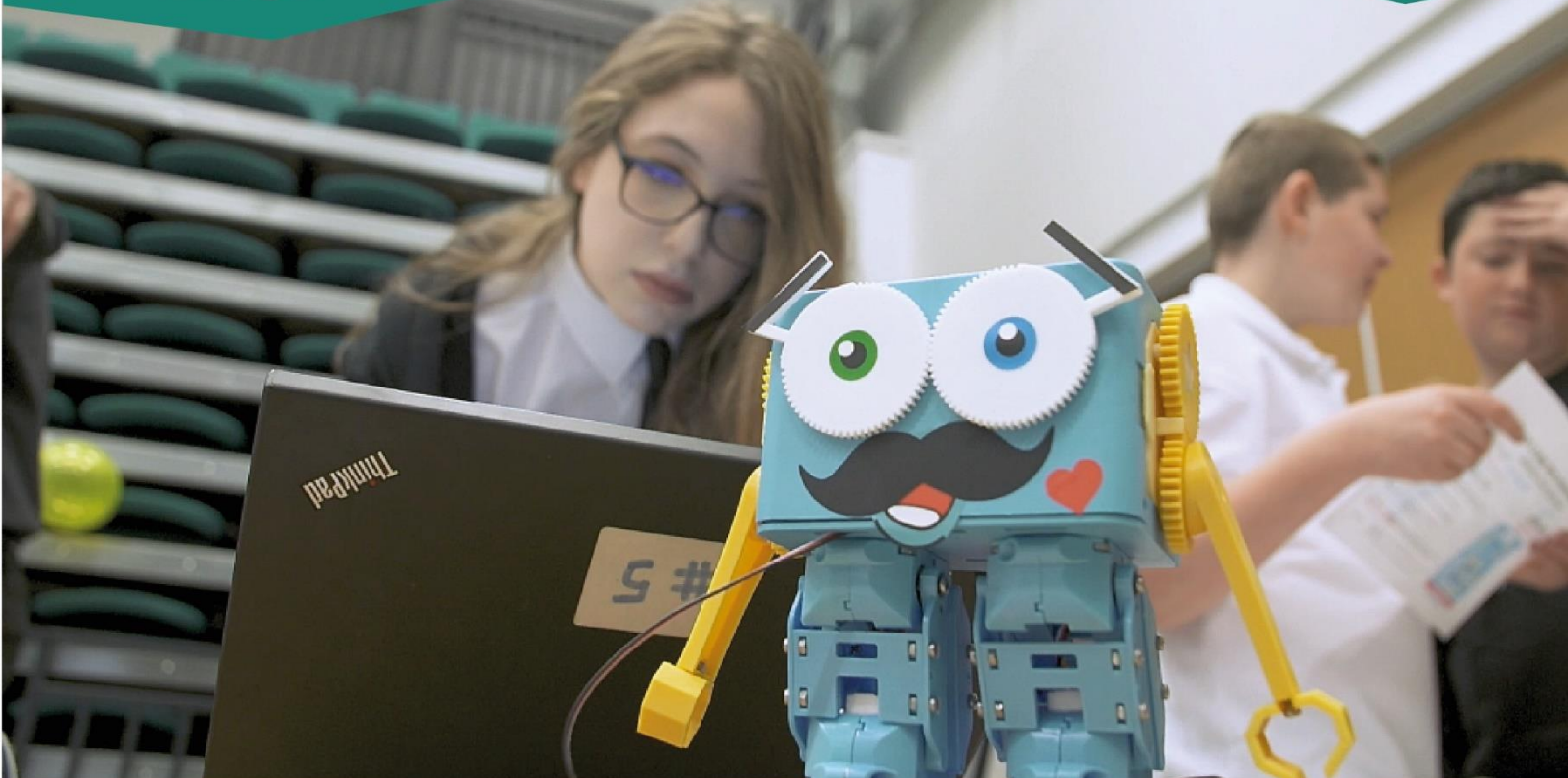
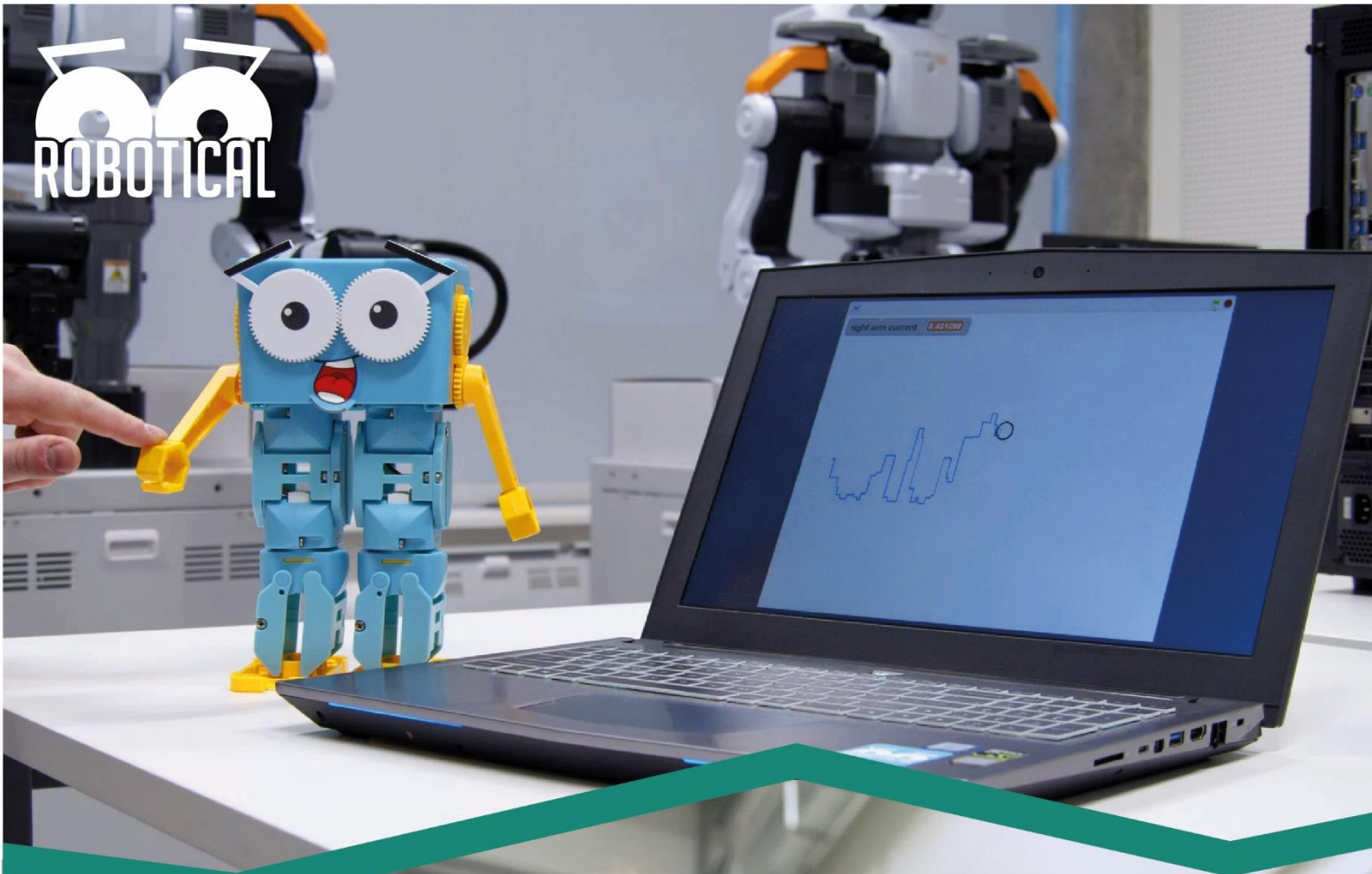


ROBOTICAL



MARTY
THE ROBOT V2

Educator's Guide
Secondary School Education

CONTENTS

Introducing Marty the Robot	1
Lesson plans & resources	2
How Marty transforms learning	3
Marty in the classroom	4
Learning & progression	4
Extending learning outside of the classroom	6
Get in touch	7

INTRODUCING MARTY THE ROBOT

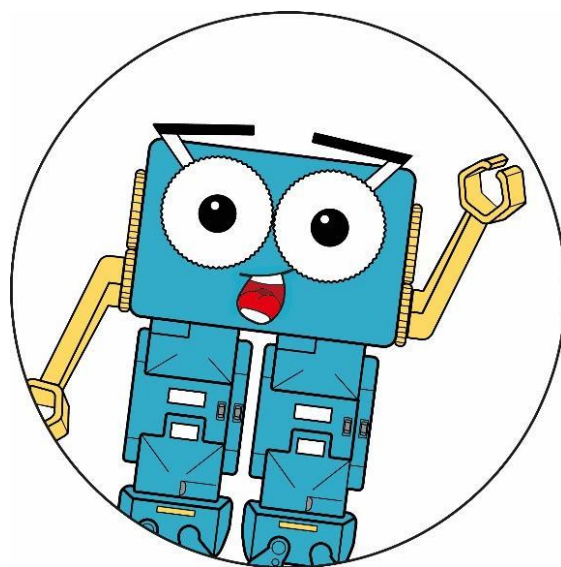
Marty is our fully programmable and customizable walking robot designed to bring learning in the classroom to life. Designed by roboticists in Scotland, Marty helps you teach STEAM (Science, Technology, Engineering, Arts & Mathematics) subjects in a fun and interactive way. By promoting problem solving and creative thinking, Marty can give learners an introduction to computer science while being adaptable and keeping them challenged through project-based learning. Failure is seen as a positive: a catalyst to encourage improvement.

Computer science educators can use Marty in a classroom to engage learners in a range of programming and computational thinking opportunities. Teachers of other subjects will find a variety of cross-curricular resources, designed to enhance learning experiences. Our classroom solutions come with initial setup support and plenty of online tools and resources to help get you up and running in no time.

Empower learners to progress independently on their learning journey as they explore how Marty works through experiential learning. Marty lessons are differentiated to allow all learners to engage with objectives and achieve success: we provide ideas to support or challenge the range of learners, in your classes, through an inquiry-based approach; additionally, the offered resources detail cross-curricular opportunities when planning for learning.

Programming in languages like Scratch, Python and JavaScript, learners can control whole movements or individual motors, read sensors, and make up their own routines for Marty to complete. For more advanced robotics projects, upgrade Marty with a Raspberry Pi computer to take the first steps to building an autonomous robot.

Marty supports learners to develop STEAM skills such as computational thinking, technical design, collaborative work, creativity, and critical and logical thinking. Additionally, working with Marty encourages learners to engage with a global maker community.



LESSON PLANS & RESOURCES

Built with educators in mind, our freely available resources help you to deliver hands-on learning. Learners can develop their creative thinking and problem-solving skills while learning important concepts across the curriculum: from computational thinking to robotics, mathematics, physics, and more. Our online resources are there to support you with new and exciting technology and cross-curricular ideas on different projects you can undertake with your learners.



Lesson Plans

Learning Plans with Measurable Objectives

Teacher Guides

Support to Enhance Learning Activities



Curriculum Links

Alignment to Regional Standards

Additional Content

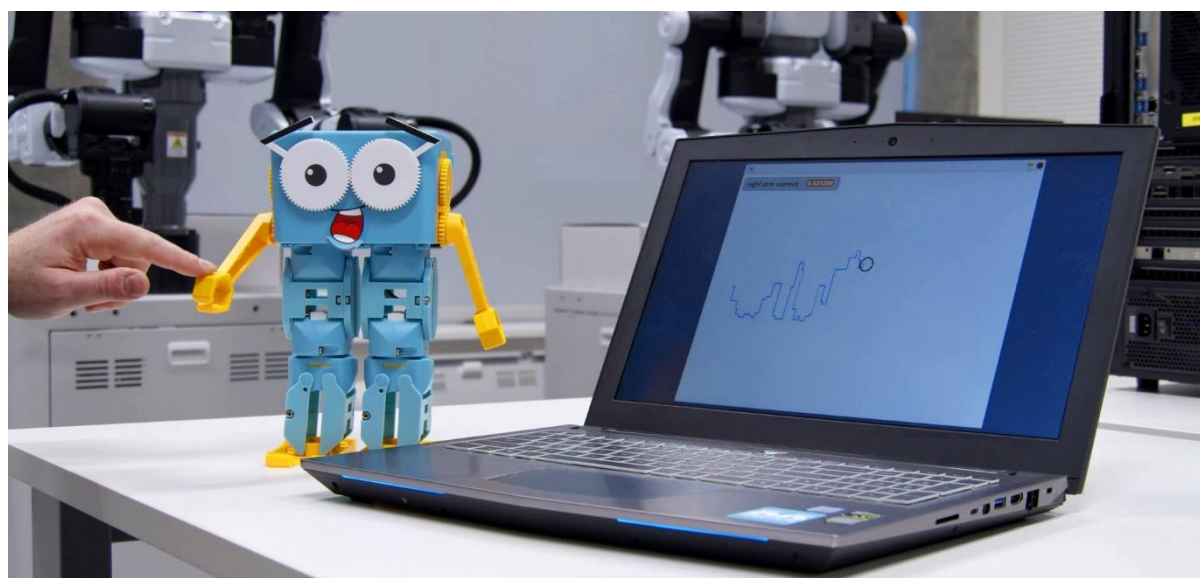
All Resources & Solutions Included



Presentation Slides

Content for Learners and Notes to Support

All our online lesson resources target benchmarks and outcomes from global curricula. We would be more than happy to help map our resources to your state's curriculum.



HOW MARTY TRANSFORMS LEARNING

Having a physical tool like Marty allows abstract concepts to become even more relatable – you can immediately see the results of running your code through the movements and actions of Marty. Make the challenge of explaining the logic and principles of coding and engineering easier to grasp, using a responsive Marty. Consolidation is a recurring feature because of the opportunities for regular, engaging practice.

LEARN MORE THAN CODE

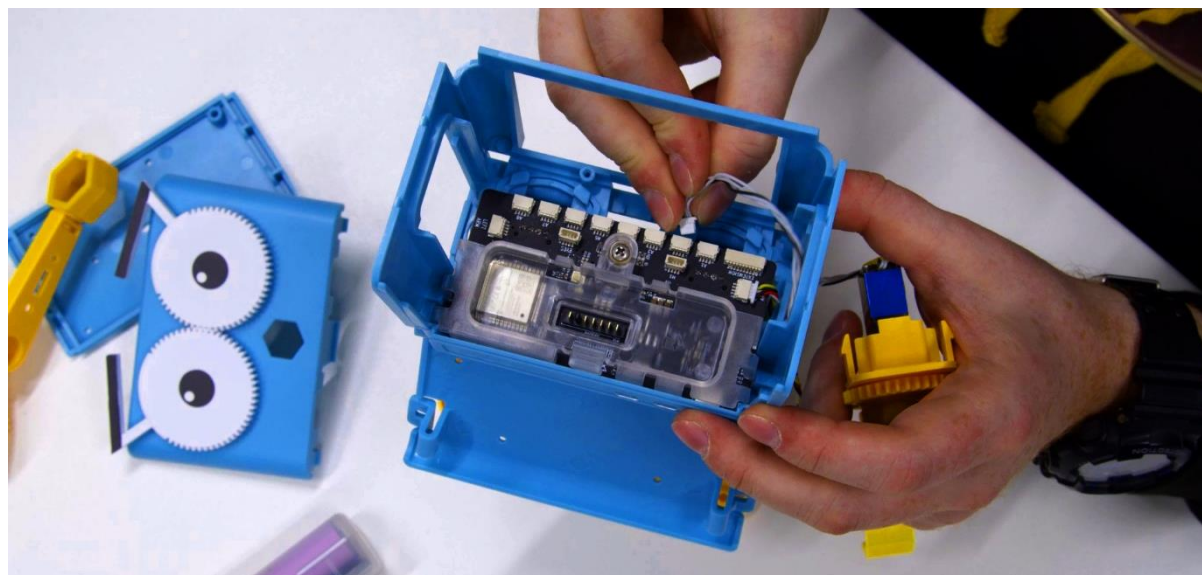
Robotics, electronics, mechanical engineering, mathematics, and literacy can all be explored with Marty. Direct and script a play with Marty as the main character on stage; investigate the angles in different shapes and code Marty to navigate around them; use math to process sensor readings and build a more intelligent robot.

PROGRESSION AS SIMPLE AS 1, 2, 3

Our online resources include activities for all skill levels, allowing educators to focus on planning the learning experiences and reporting on progress, while learners progress at an appropriate speed. For those starting their coding journey, our MartyBlocks platform, built on Scratch, is a block-based language that supports the learning of entry coding principles. With this, learners are supported to build working code with blocks that snap together to create sequences. Following on from this, Marty makes it possible to advance learning with industry-level languages, like Python. Marty represents a long-term learning experience due to its inherent versatility and adaptability.

ENCOURAGE AND DEVELOP PROBLEM SOLVING

While developing programs for Marty, learners are developing more than just their coding skills: young people are supported to become collaborators, creative thinkers, problem solvers, computational thinkers, and digital leaders of the future.



MARTY IN THE CLASSROOM

Marty is an adaptable tool that can be used across Elementary, Secondary, and even collegiate education. By sparking the excitement of young people and harnessing their infectious enthusiasm, Marty can support the promotion of STEAM learning and engagement. Marty enhances the excitement of learning about technology through hands-on interactive experiences while promoting a learn-through-play ethos.

Programming with Marty challenges learners to explore more advanced concepts such as analysis of problem-solving, using industry-level text-based programming languages. Lessons with Marty at this level support:

- Analyzing algorithms for accuracy and identifying faults
- Understanding the world through computational thinking
- Designing, testing and building computing solutions
- Understanding data structures and processing real-world data from sensors
- Evaluating and justifying solutions, including efficiency of code
- Describing aspects of a real-world computing system and comparing against a learner's own solutions

LEARNING & PROGRESSION

Marty the Robot was developed to support a learner's progression: beginners can consolidate their awareness with MartyBlocks (based on Scratch), while those who are more experienced can engage in text-based languages, like Python. Advanced learners can continue their journey and engage Marty through Javascript or C++.

GET STARTED WITH MARTYBLOCKS

MartyBlocks (based on Scratch) is the best place to revisit programming. It focuses on blocks of code that you can drag, drop, and click together to build a program. Combining these blocks, learners can build basic to complex programs to bring their Marty to life. MartyBlocks has been designed to help everyone take those first steps into programming by teaching basic sequencing and thinking of programming as a list of basic instructions.

Both our MartyBlocks & MartyBlocks Jr programming environments can be found on our Marty the Robot tablet V2 app.

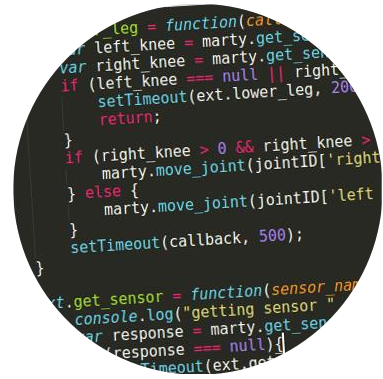


DEVELOPING WITH PYTHON

After building your learners' confidence with MartyBlocks, the next step is to make the move to text-based programming. Python is used around the world by industry and is the perfect next step for learners. You can program Marty in Python using a library that we have developed called *marty*.

marty contains definitions for the walk function, which can be used to make Marty walk. Using our *marty* library, you can gently introduce learners to programming with Python, without having to start with the more complicated parts, focusing on building their knowledge of programming and robotics.

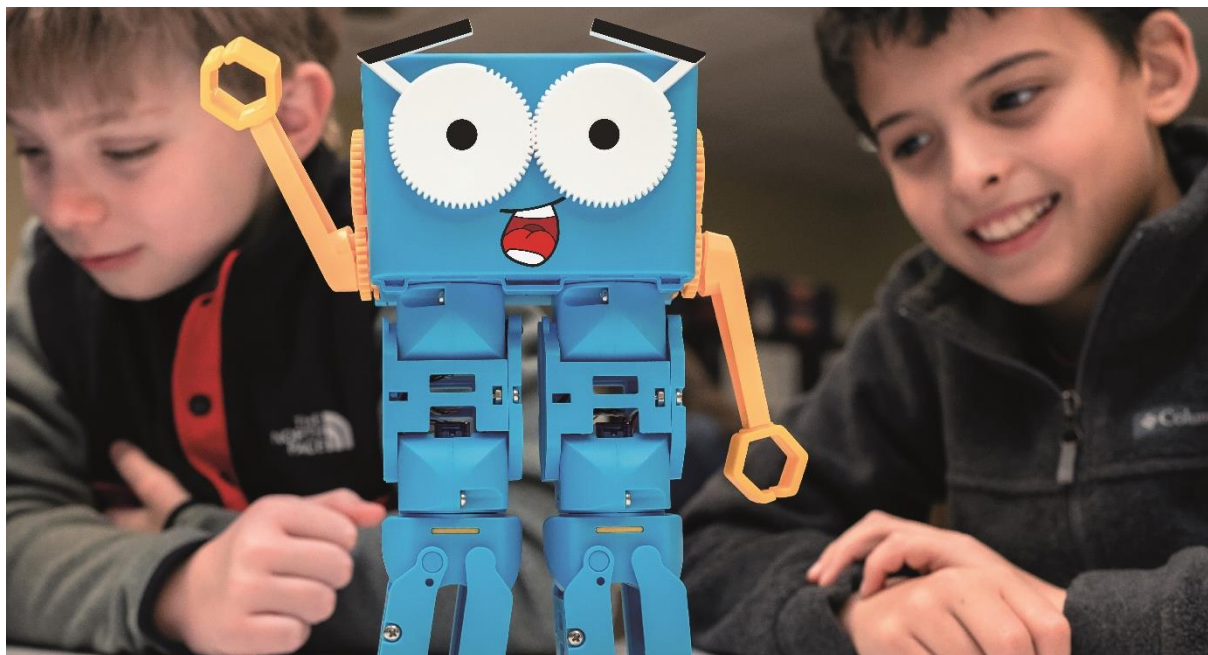
For more information on how to get started with Python and *marty*, go to the *Robotical* website to view our tutorial and documentation.



FURTHER WAYS TO CODE

We believe in the power of keeping our platform open so you can also code Marty using JavaScript & C++. To take your classes' learning with Marty even further, challenge your learners to build a fully autonomous robot using ROS (Robot Operating System) by connecting a Raspberry Pi and a camera. This gives Marty vision and lets you code Marty to play soccer completely by themselves.

For more information on using a Raspberry Pi with ROS and a guide to getting started, check our website.



EXTENDING LEARNING OUTSIDE OF THE CLASSROOM

If you would like your school to learn more about programming, we recommend the following sites to find specialist tutorials for other professionals. Each of these sites offers open-source learning for whoever requires them – no matter the age or development stage.



Scratch
scratch.mit.edu



Raspberry Pi
raspberrypi.org



Python
wiki.python.org/moin
trinket.io



JavaScript
javascript.info
codecademy.com



ROS
wiki.ros.org



C++
cplusplus.com

CONNECTING EDUCATION TO COMMUNITY

As an open-source education tool, Marty has gathered a strong community following. This community consists of makers and educators who are actively contributing to additional content. The result is a wide network of challenges and activities that can be shaped for the classroom.

If you would like to join our online Facebook Edu Community Group, please use the link below or search for the group name:



Group Name: *Robotical's Edu Community*



Group Link: www.facebook.com/robotical/groups

GET IN TOUCH

Education

Finlay@robotical.io

Distribution & Partnerships

Ben@robotical.io

School Sales

Calum@robotical.io

Support

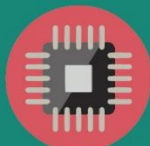
Support@robotical.io



See Marty in action at robotical.io



Smart



Educational



Expandable



Programmable



Interactive