Control and Automation Engineering

Research Topics and Projects

INSTITUTO MAUÁ DE TECNOLOGIA

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{1 Fields of Research }

INSTITUTO MAUÁ DE TECNOLOGIA

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Intelligent Mechatronic Systems and Robotics (SMIR)

Main Research Line: Development of multi-agent mechatronic systems with applications in intelligent industrial systems, autonomous robots, service robots, and smart cities.

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Intelligent Mechatronic Systems and Robotics (SMIR)

Smart Cities

Service Robots

Intelligent Manufacturing Systems and Digital Manufacturing

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Autonomous Vehicles

Autonomous electric vehicle for last mile transportation

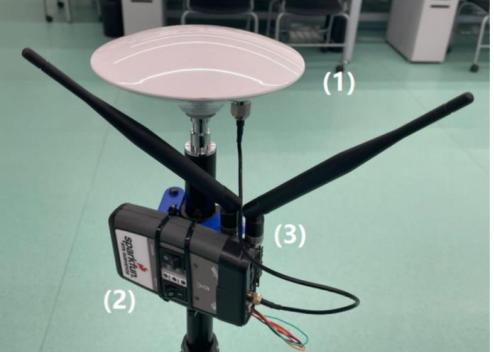
- Body design
- Vehicle automation: steering, acceleration and braking
- Sensors for localization and obstacles detection
- Navigation algorithms

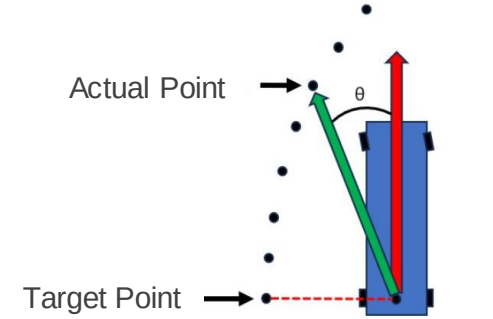
Autonomous Vehicles

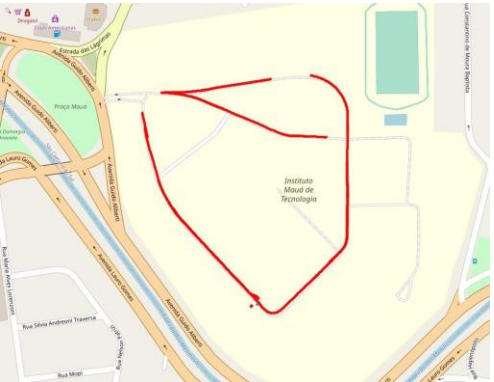
Autonomous electric vehicle for last mile transportation

Vehicle automation: steering, acceleration and braking

Sensors for localization and obstacles detection







Autonomous Vehicles

Autonomous electric vehicle for last mile transportation

Vehicle automation: steering, acceleration and braking

Sensors for localization and obstacles detection

Autonomous Vehicles

Autonomous electric vehicle for last mile transportation

Sensors for localization and obstacles detection

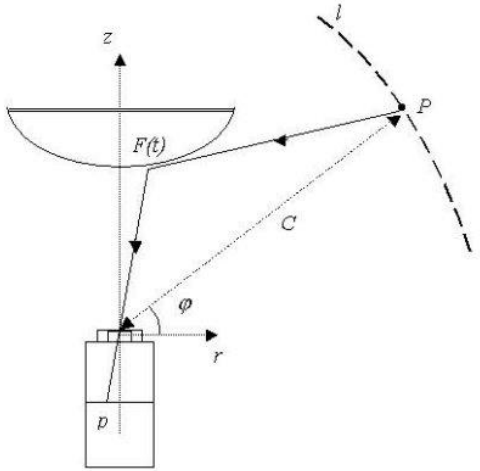
- Stereo Vision
- Object detection and localization in stereo vision

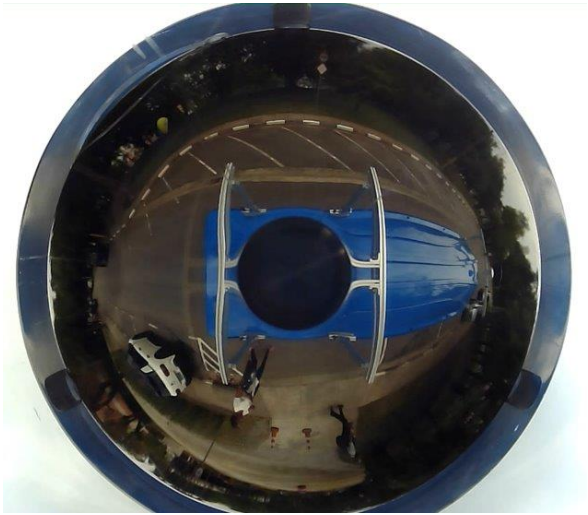
Autonomous Vehicles

Autonomous electric vehicle for last mile transportation

Catadioptric omnidirectional vision system:

Camera and a mirror capable of viewing 360º of the environment



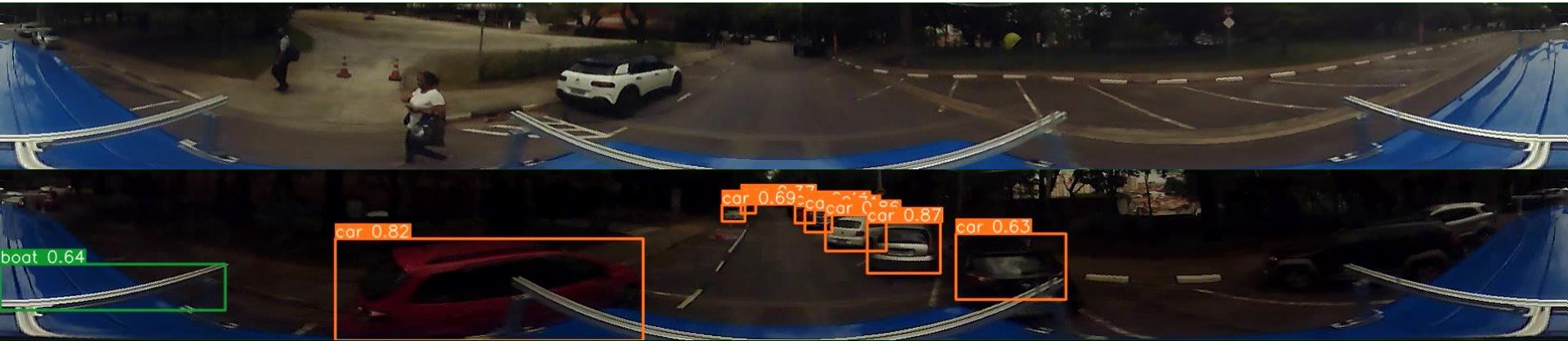


Autonomous Vehicles

Autonomous electric vehicle for last mile transportation

Catadioptric omnidirectional vision system:

- Camera and a mirror capable of viewing 360º of the environment
- Object detection in omnidirectional image

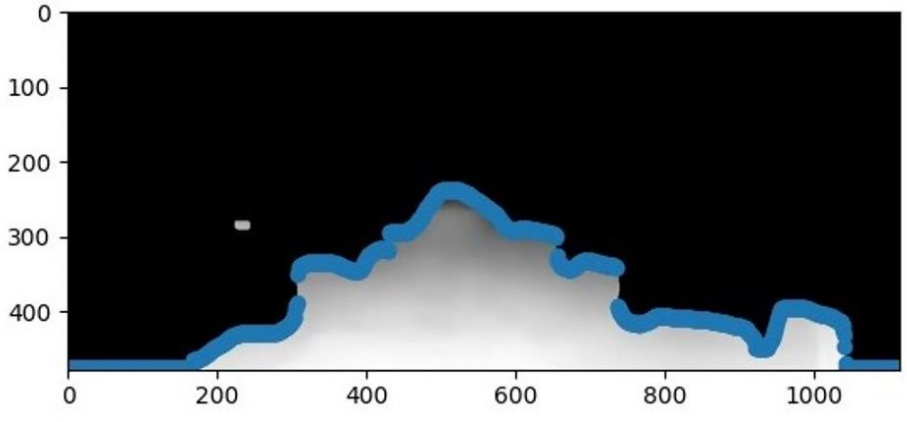


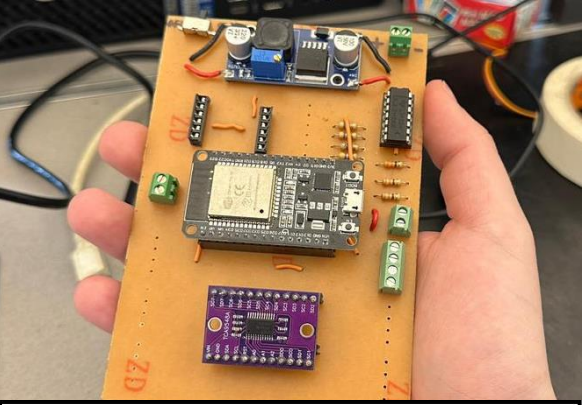
Autonomous Vehicles

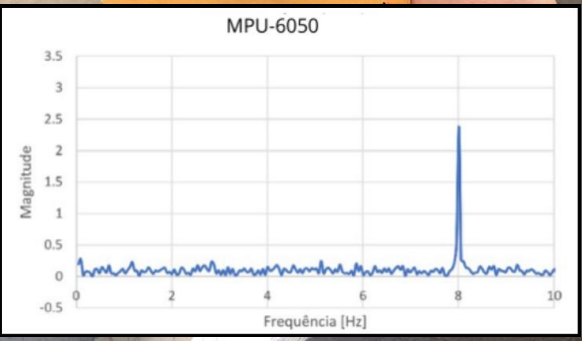
Autonomous electric vehicle for last mile transportation

Applications of Artificial Intelligence

Street and free space detection







IoT in Smart Cities

Intelligent system for monitoring bridges and viaducts

- Hardware Development
- Signal Processing and Data Analysis
- Web development

Service Robots

Research focusing on improving the interaction between service robots and humans

Human-Robot Interaction (HRI)

Autonomous Navigation and Environment Understanding

Task Learning and Adaptation

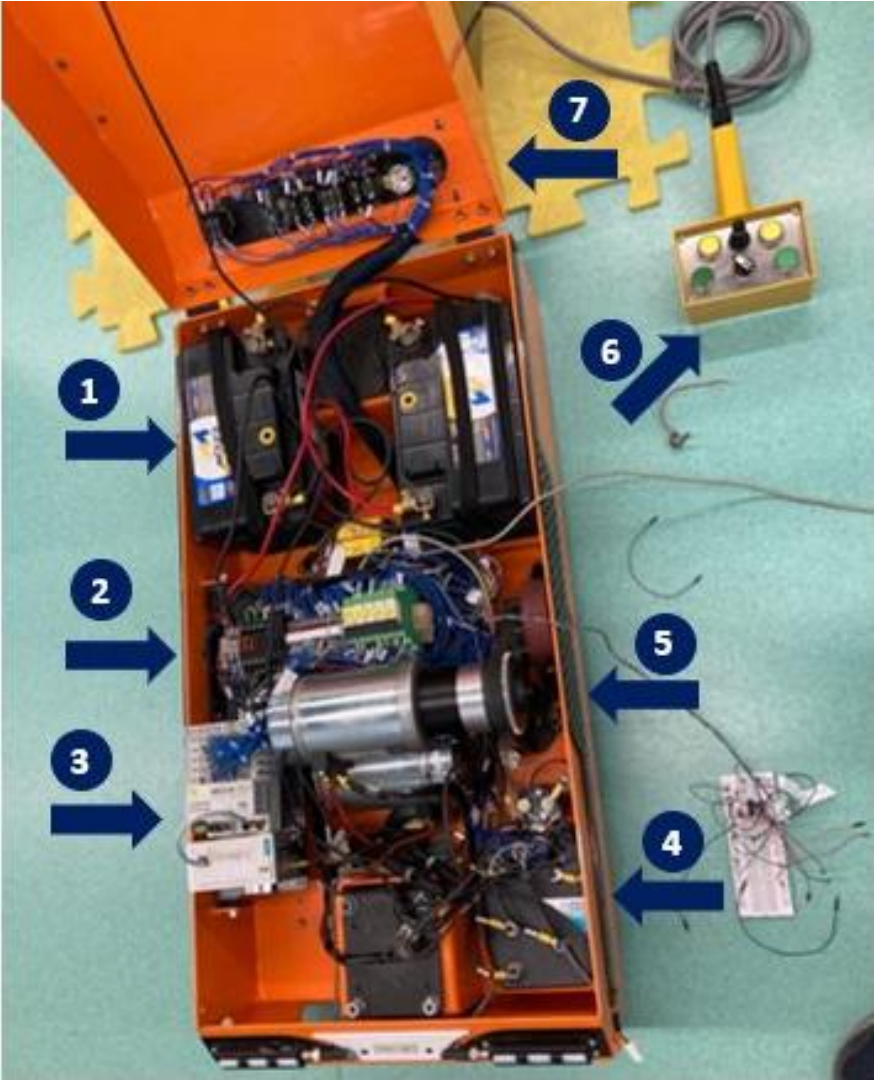
Industrial AGV / AMR

Hardware and software for navigation systems

Sensors for localization, mapping and object detection (LIDAR, 3D camera, IMU, radio emitter)

Simultaneous localization and mapping (SLAM) using odometry, 3D cameras and LIDAR

Trajectory planning and navigation algorithms



Industrial AGV / AMR

Hardware and software for navigation systems

1 Batteries

2 Terminal Block

3 PLC

4 Driver

5 Motor and Transmission

6 Remote Controller

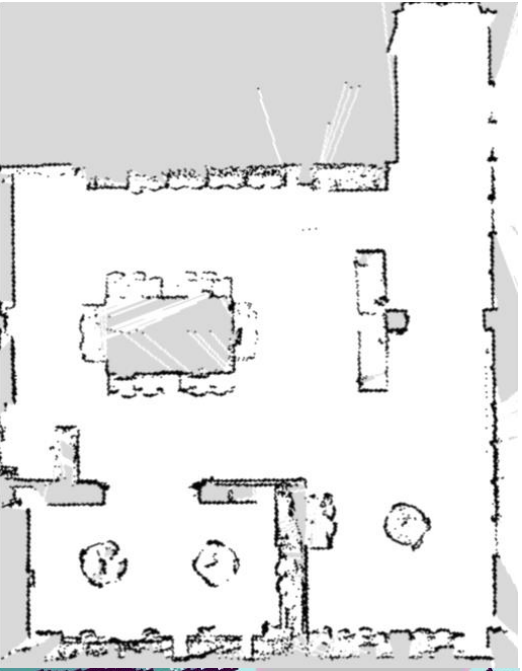
7 Push Button Station

Industrial AGV / AMR

Sensors for localization, mapping and object detection

1 3D Camera with IMU

2 LIDAR



Industrial Autonomous AGV

Simultaneous localization and mapping (SLAM)

Trajectory planning and navigation algorithms

Intelligent Manufacturing Systems

Automated welding quality inspection

AI

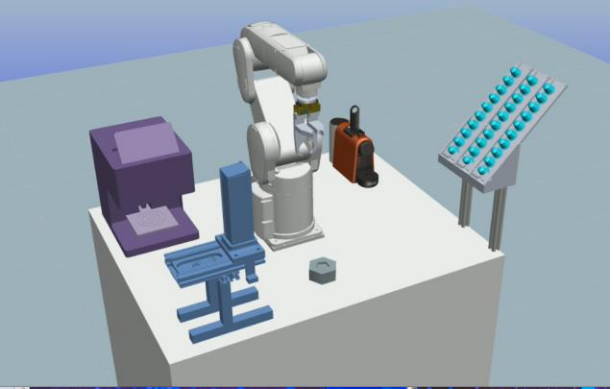
Computer Vision + Artificial Intelligence

Intelligent Manufacturing Systems

VRFactory

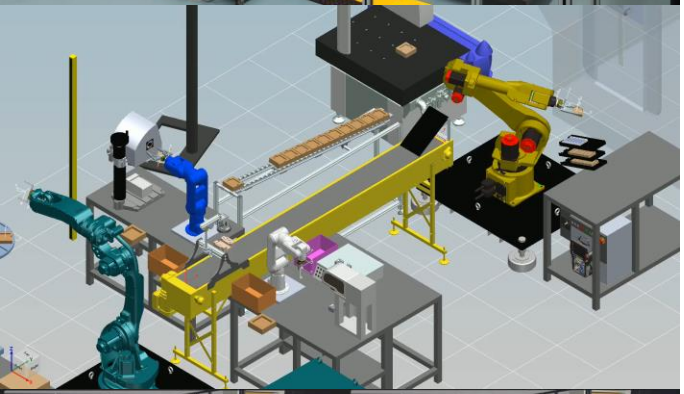
Development of auxiliary systems to support VR.

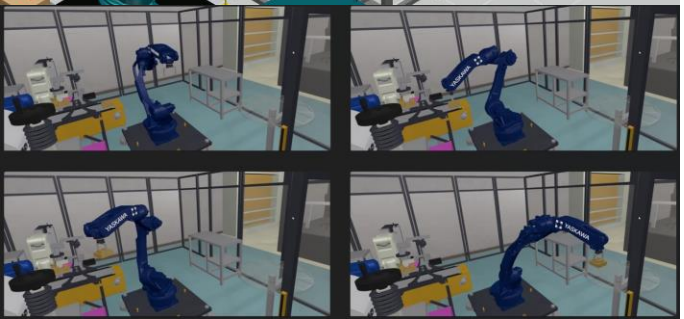
Development of an immersive and open-source platform for commissioning and simulation of a factory via Unity Engine.



Industry 4.0

Development of demonstrators for Industry 4.0 concepts integrating various technologies and manufacturers.





Multiplatform Virtual Commissioning

Comparative and Intensive Study of Virtual Commissioning and Digital Twins Application on 3 Platforms:

- Siemens Tecnomatix;
- 3D Experience
- Unity.

{2 Student Projects}

Robotics Competitions

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KIMAUÁNISSO

Since 2004

28 Students

03 Professors

Number of trophies

245

2022 – 38 Trophies

2023 – 45 Trophies

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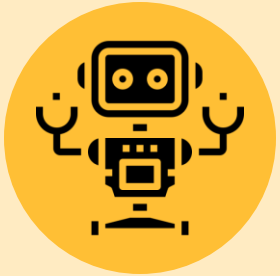
Radio Controlled

Hockey

Combot



Artbot

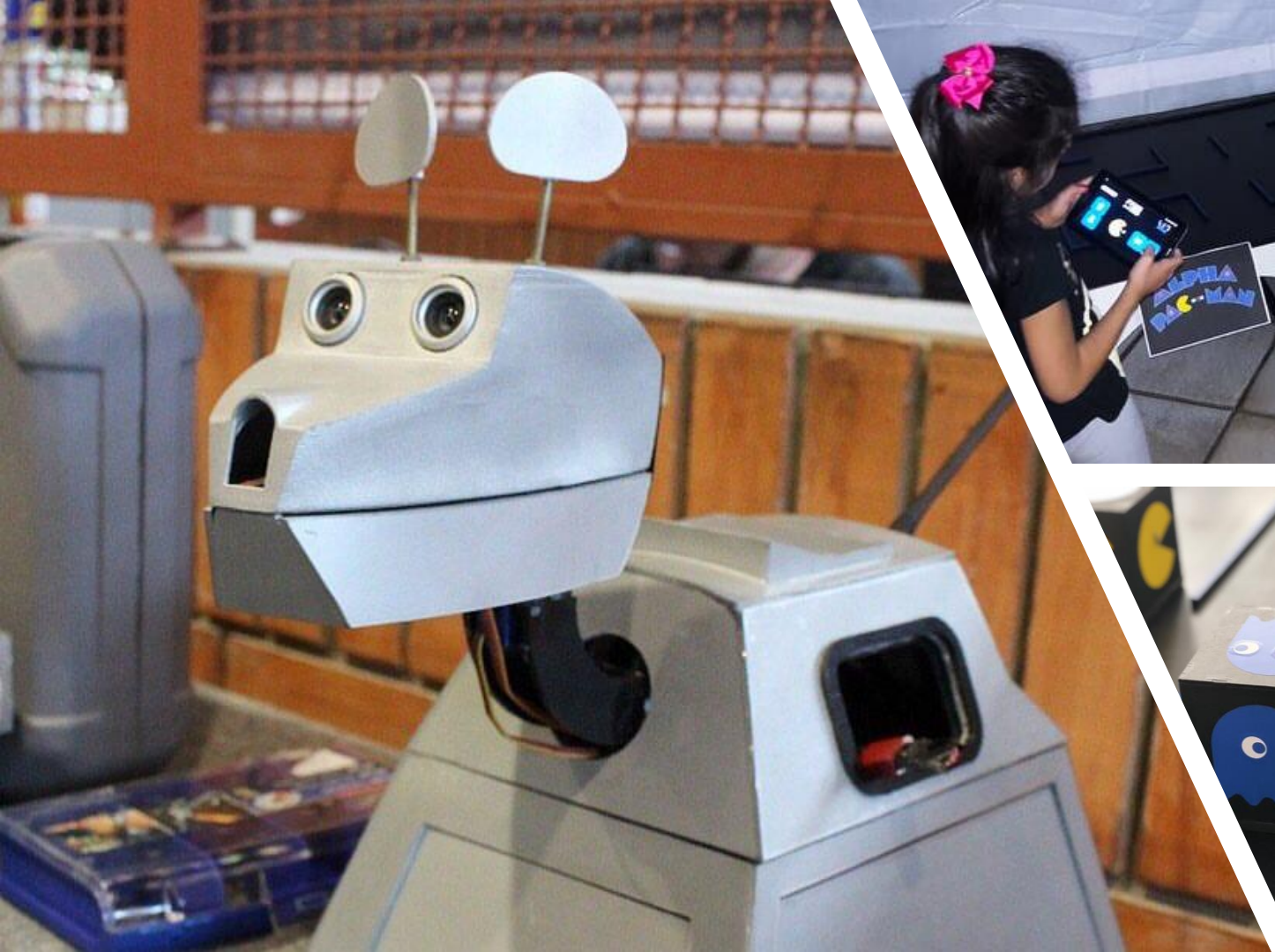
KIMAUÁNISSO

Autonomous

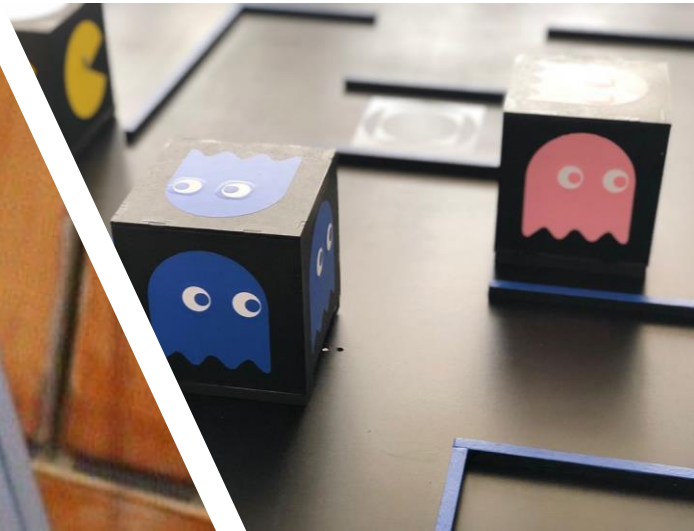
Sumô

Trekking

Line Follower

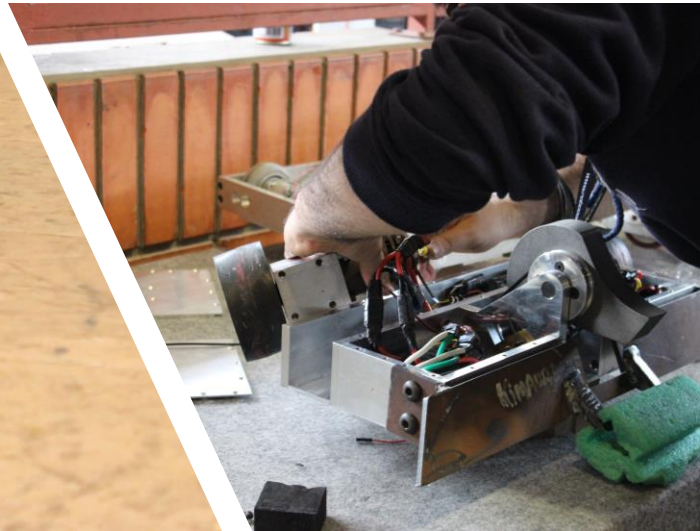


ALPHA
PAC-MAN




www.robocore.net

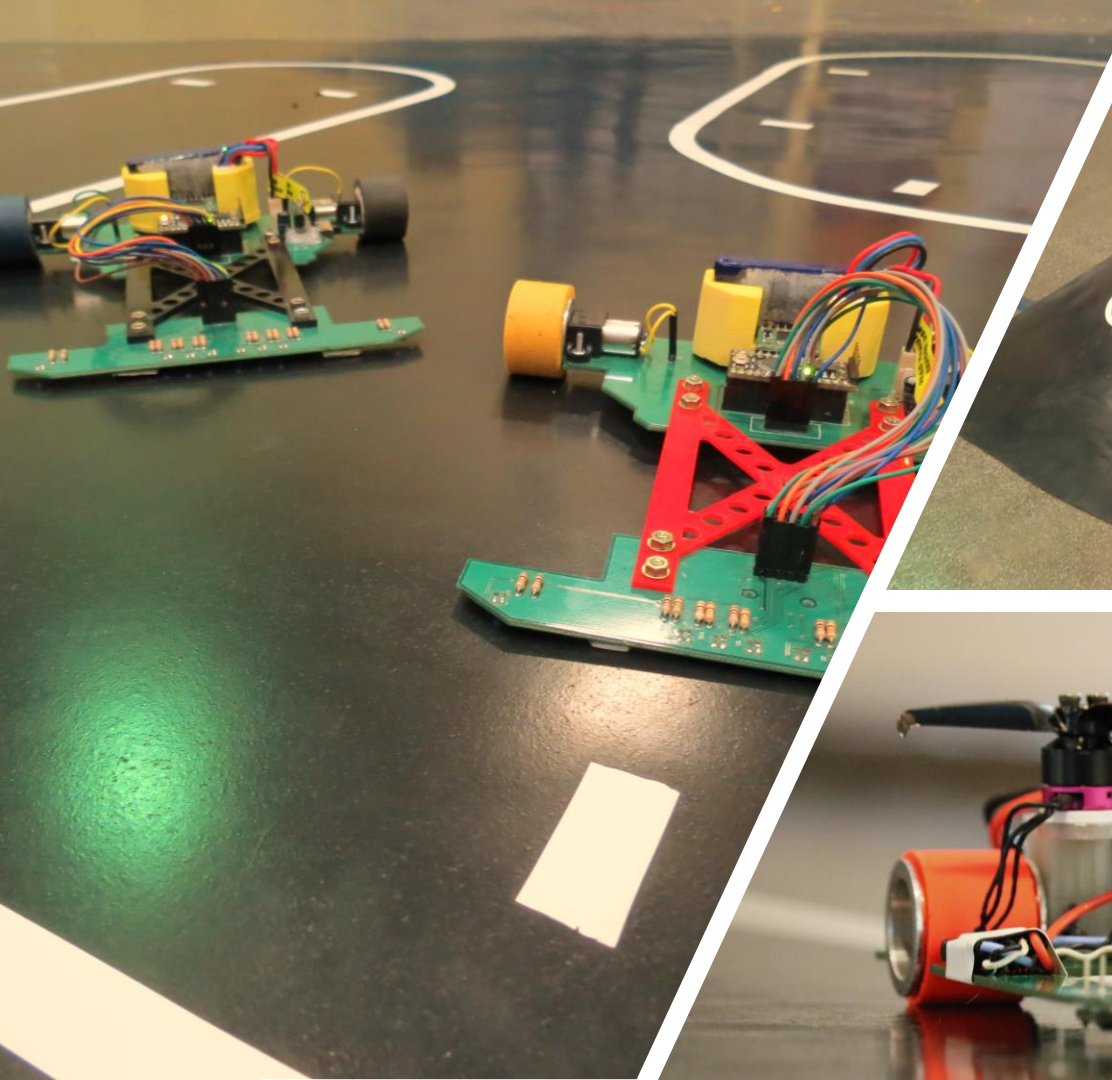

www.robocore.net

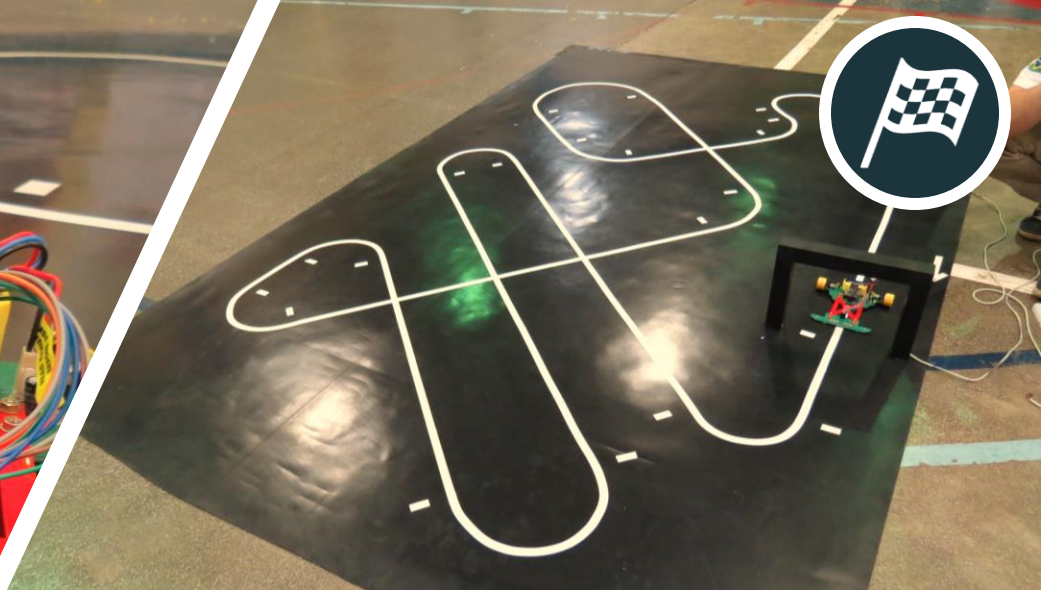


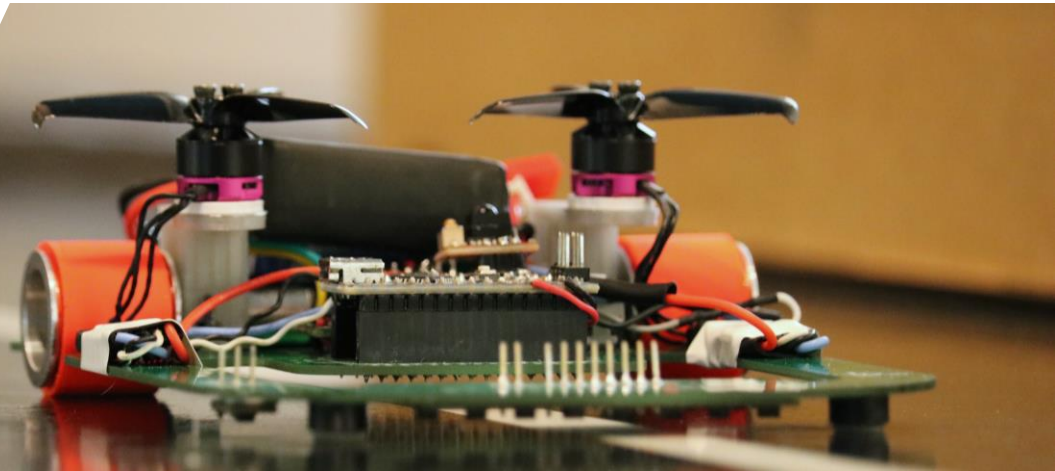

MAUA

MAUA

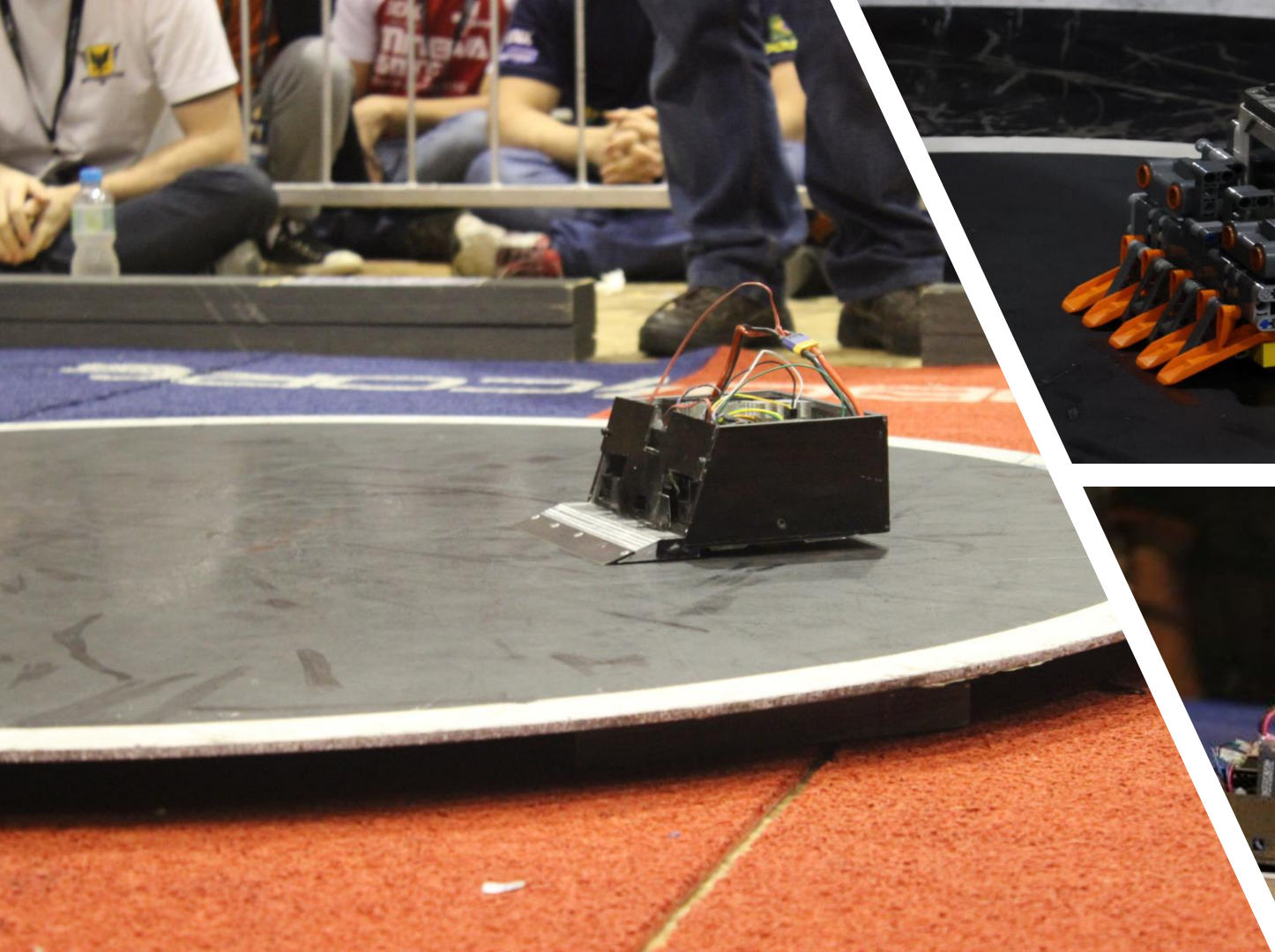

Huguinho
11
MAUÁ

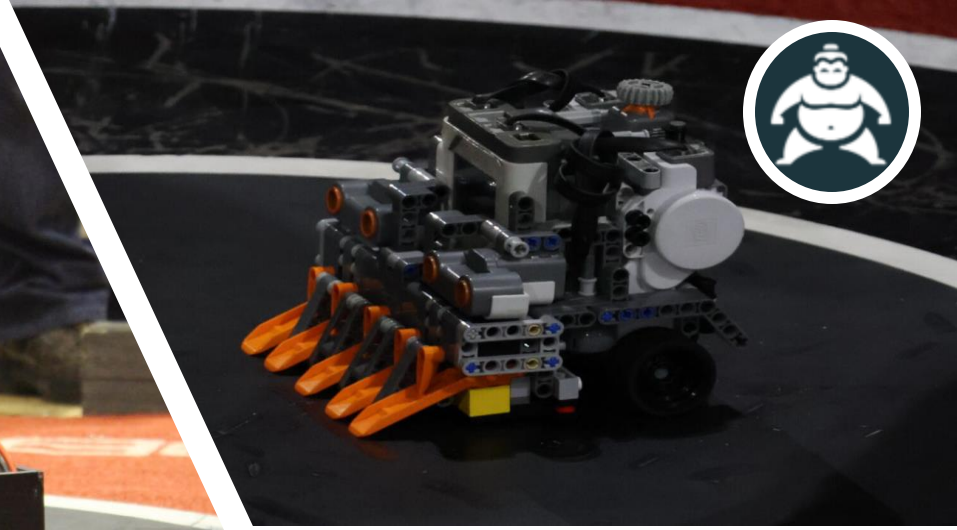


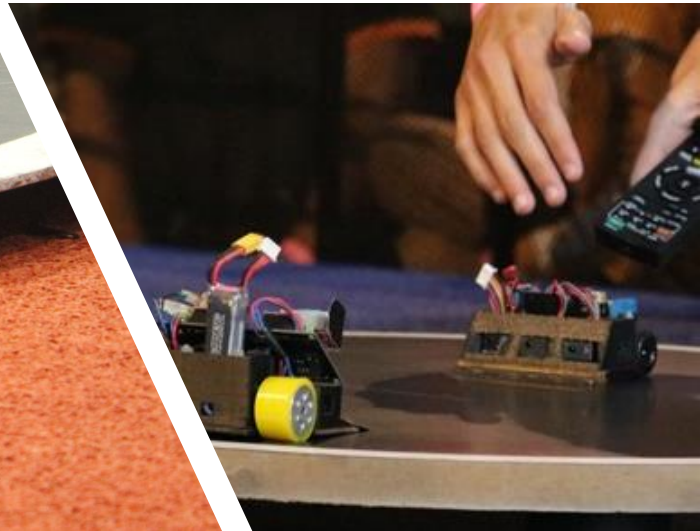




KIMAUÁNISSO
ROBOTICS TEAM








第27回全日本ロボット相撲大会
INTERNATIONAL ROBOT SUMO TOURNAMENT 2015


全日本ロボット相撲大会2018
ALL JAPAN ROBOT SUMO TOURNAMENT 2018
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ALL JAPAN
ROBOT-SUMO
TOURNAMENT
FUJISOFT


第29回全日本ロボット相撲大会
International ROBOT SUMO Tournament 2017


I am Mr. Hiroshi Mizawa
the Chairman of this Tournament.
FUJISOFT


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GO FOR JAPAN
KIMAUÁNISSO ROBOTICS TEAM
Liga Nacional de Robótica
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ROBOT SUMO ARGENTINA
AYACUCHO BUENOS AIRES ARGENTINA
2019

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