ROBOMASTER

IEEE

IEEE Robotics & Automation Society

THE ICRA 2018 DJI ROBOMASTER AI CHALLENGE
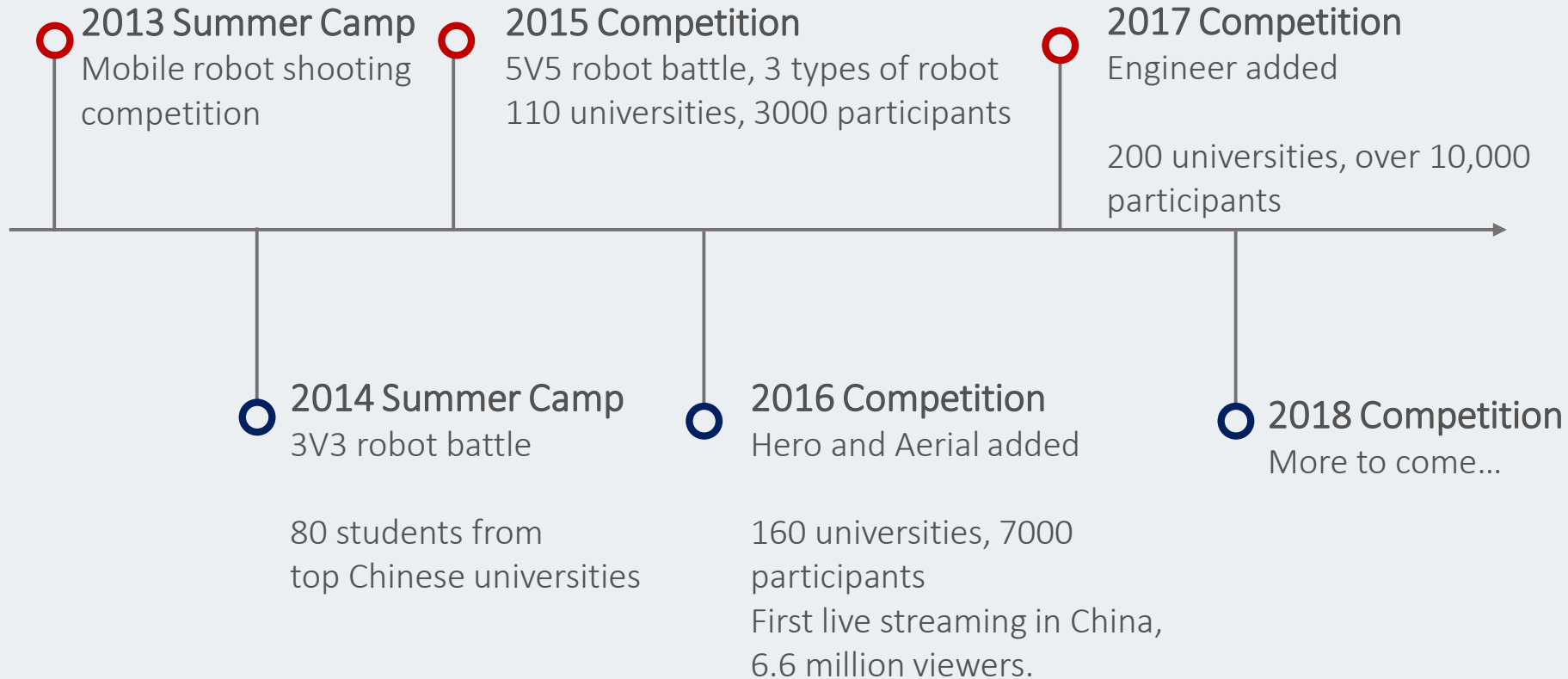
BRISBANE ▸ AUSTRALIA

MAY.21ST - 24TH,2018

Competition Overview

- An international collegiate robotics competition based in Shenzhen, China

- Exclusively planned and operated by *DJI*

- Objectives:

  - To provide engineers a stage to demonstrate their talents while inspiring individuals or groups who have passion in science and engineering;

  - To promote the development of robotics education and robotics research.

Competition Overview

2013 Summer Camp
Mobile robot shooting
competition

2015 Competition
5V5 robot battle, 3 types of robot
110 universities, 3000 participants

2017 Competition
Engineer added

200 universities, over 10,000
participants

2014 Summer Camp
3V3 robot battle

80 students from
top Chinese universities

2016 Competition
Hero and Aerial added

160 universities, 7000
participants
First live streaming in China,
6.6 million viewers.

2018 Competition
More to come…

2018 Competition

■ **Track 1**

- RoboMaster FPS Competition, FPS robot game

- Target Participants: undergraduate & master students

- Team Size: 5 - 35 people

■ **Track 2**

- RoboMaster Technical Challenge, full autonomous system

- Target Participants: graduate students

- Team Size: 1 - 10 people
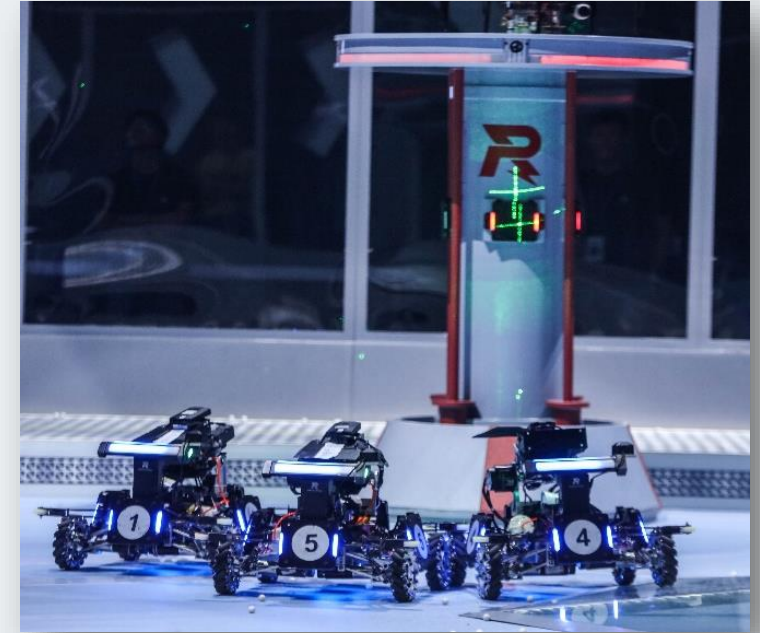
Track 1: RoboMaster FPS Competition

The Robot Squad

Teams develop their own squad of robots

Characters: Hero, Standard, Engineer, Aerial, Sentry and Supplier

Rules of Engagement

Robots are equipped with projectile turrets

Projectile Types: plastic ball (17 mm / 0.67"), golf ball (42 mm, 1.68")

Pressure sensors detect hits and deduct Health Points (HP) accordingly.

Robots are destroyed when HP is zero

VS

The Most Influential Robotics Competition in China

RoboMaster 2015 - 2017

Regional competitions in **10** cities

Over **400** teams

More than **20,000** students has competed

Over **30,000,000** online viewers

DJI has invested approx. **US $16 million**

Track 2: Technical Challenge

Another Competition Track

- Challenging topics that derive from RoboMaster FPS Competition;

- Aim to foster frontier robotics research;

- Host alongside with IEEE International Conference on Robotics & Automation (ICRA);

- The research paper can be generated from technical challenges.
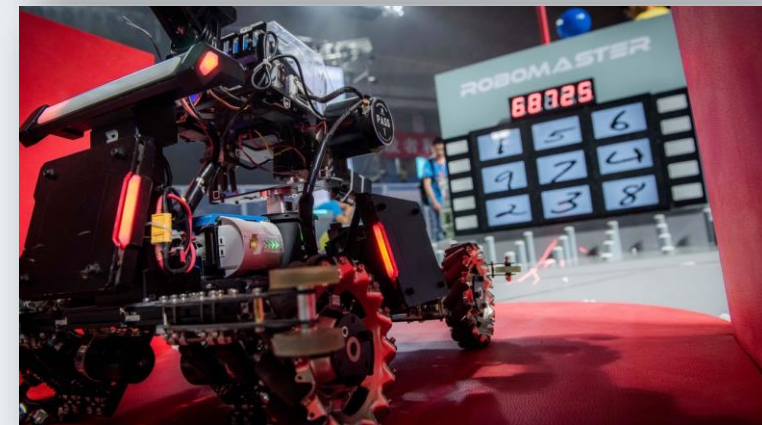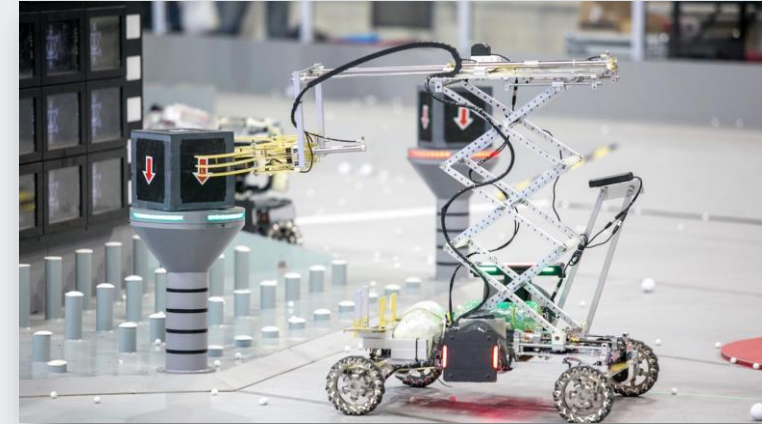
Mobile Manipulation Challenge
RoboMaster & ICRA 2017
Singapore

IEEE International Conference on Robotics and Automation (ICRA)

2017 RoboMaster Theme:

Mobile Manipulation Challenge

Mobile manipulator that can autonomously pick, transport and stack building blocks

Examines the application and competence of technologies that include positioning, object grasping, force control, target identification, and system stability.
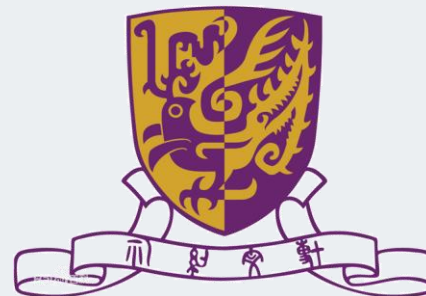
RoboMaster & ICRA 2017 Finalists included:

Monash University
Malaysia

The Chinese University of Hong Kong

Northeastern University
China

University of Koblenz-Landau
Germany

Nanyang Technological University
Singapore

University of Louisville
USA

DJI RoboMaster AI Challenge
ICRA 2018 Brisbane

Rules Briefing

- Teams must build and write autonomous operation programs for ONE or TWO RoboMaster Standard robots.

- Organizers will present TWO AI robots to challenge team robots.

- Team robots must defeat AI robots on a simple 5m × 8m Challenge Field.

*For more details please refer to the *DJI RoboMaster AI Challenge Rulebook.*

Download Rulebook: https://www.robomaster.com/en-US/resource/pages/728?type=announcementSub

Purposes

Two tracks of RoboMaster contains First Person Shooting (FPS) and Real-Time Strategy (RTS) game elements. They serve as a platform for university-level students to learning robotics and for researchers to verifying deep learning technology in a real-world environment.
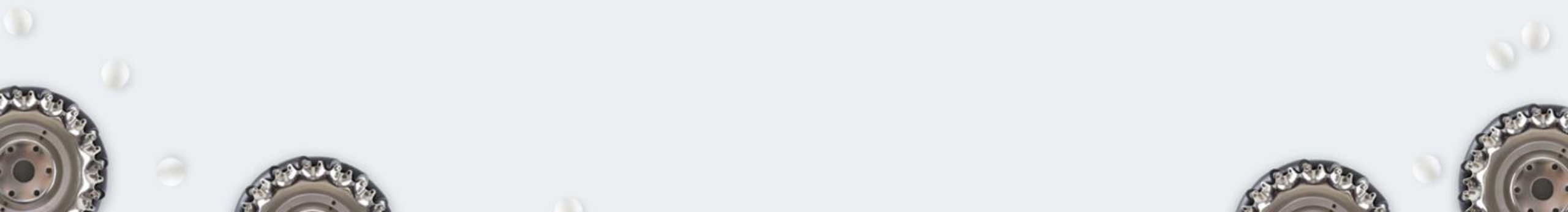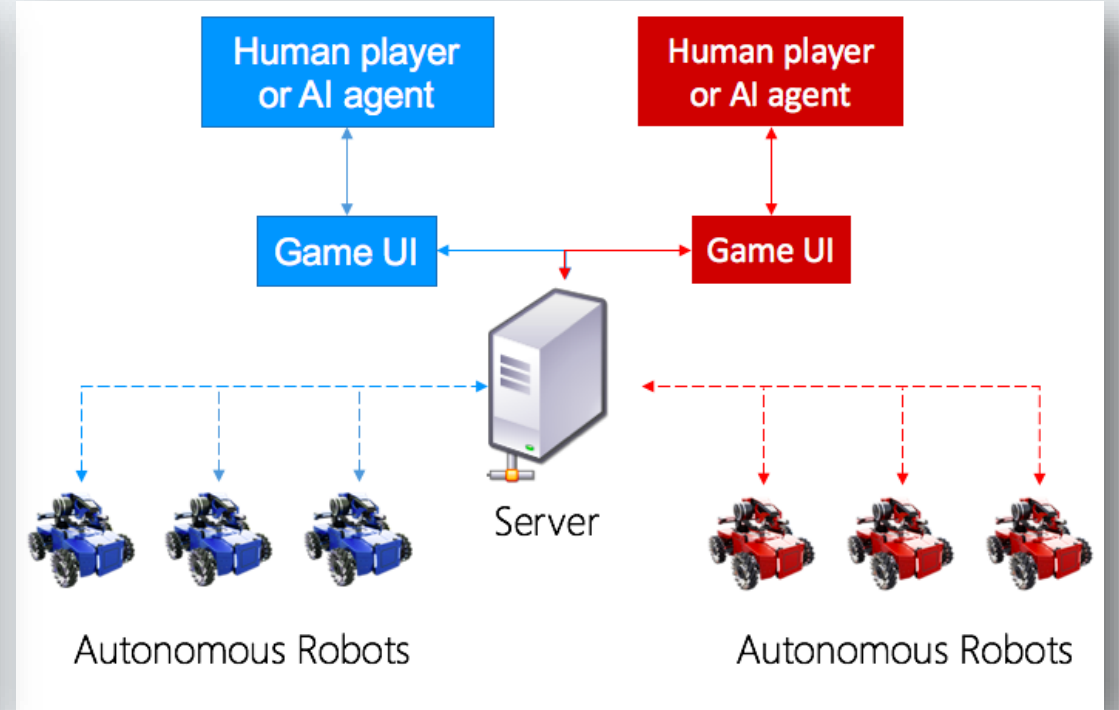
FPS Game Platform

FPS Online Game (Doom)

RoboMaster FPS Competition

# Real-Time Strategy (RTS) Game Platform

RTS Online Game (StarCraft2)

RoboMaster AI Challenge
Similar to RTS Games
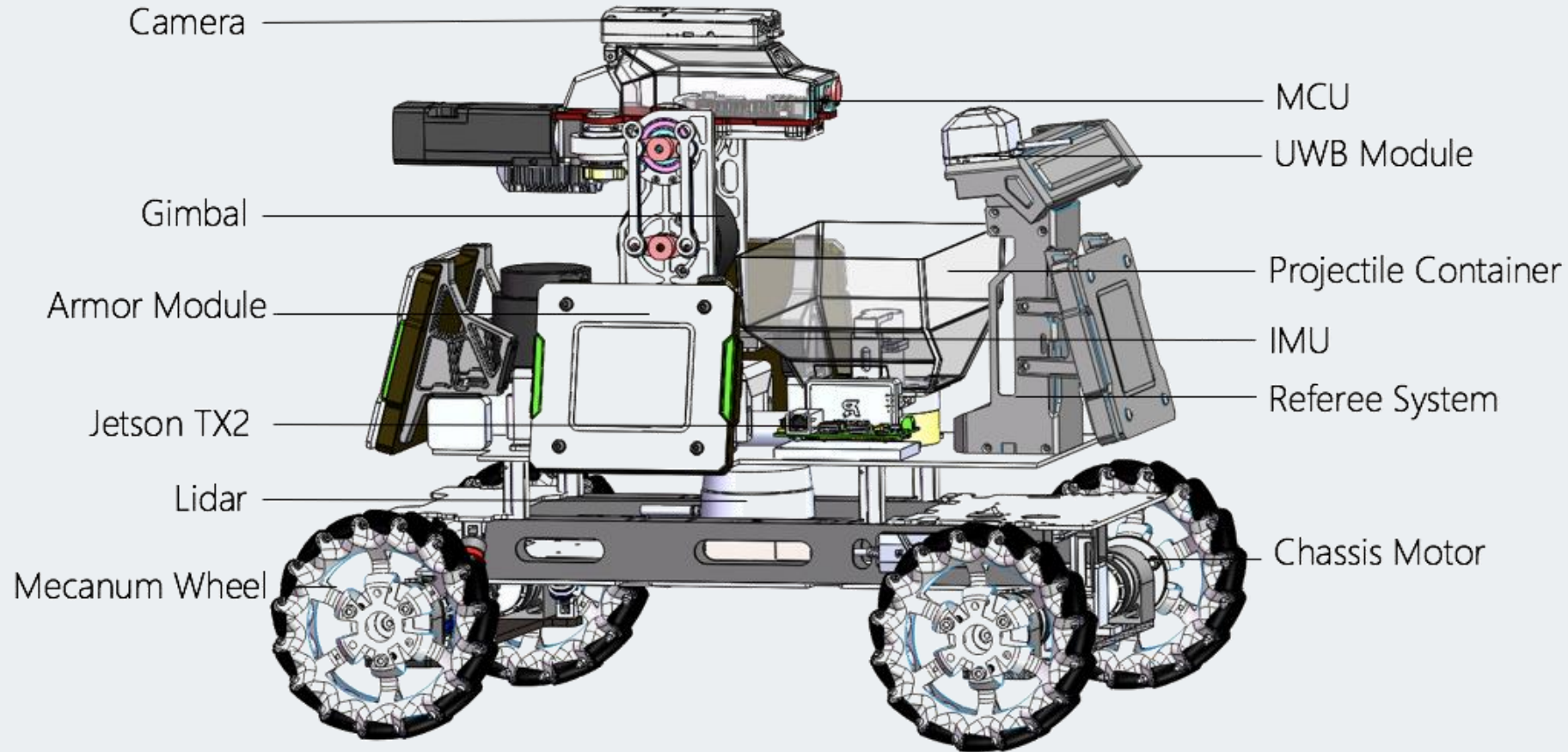
Robot RTS Framework

- RobotRTS is an open source platform for Robot Real-Time Strategy Research. DJI RoboMaster independently develops the platform;

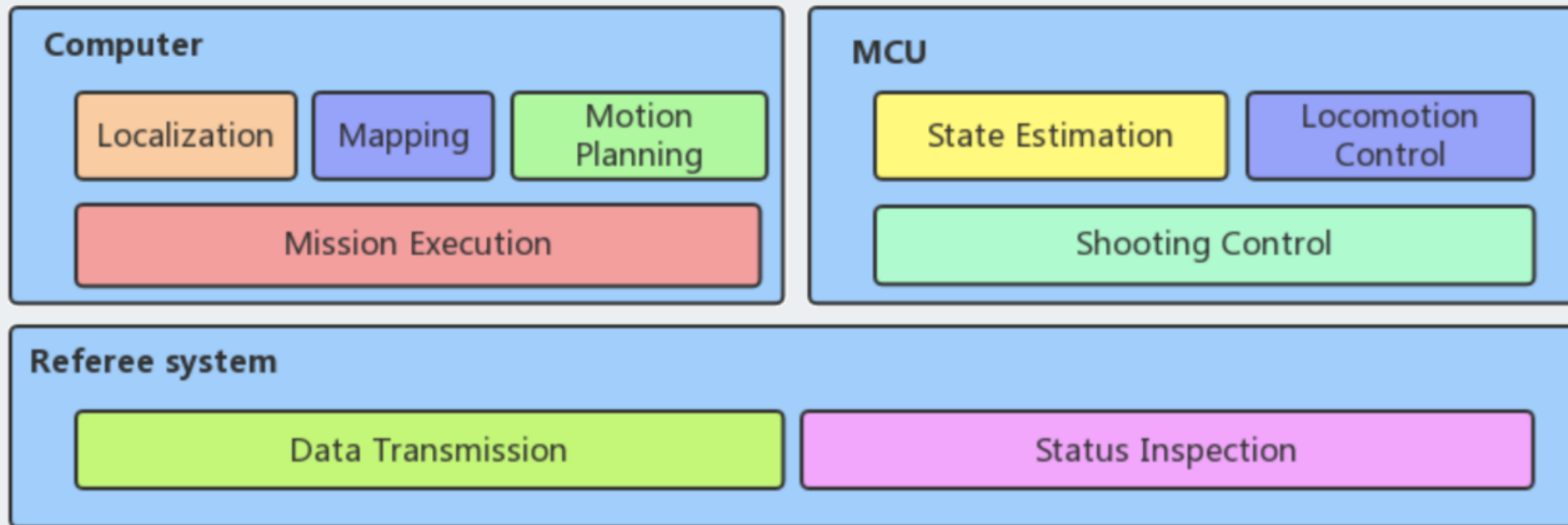- The organizer will release the Open Source Codes under the following dates are shown in right column on the figure.
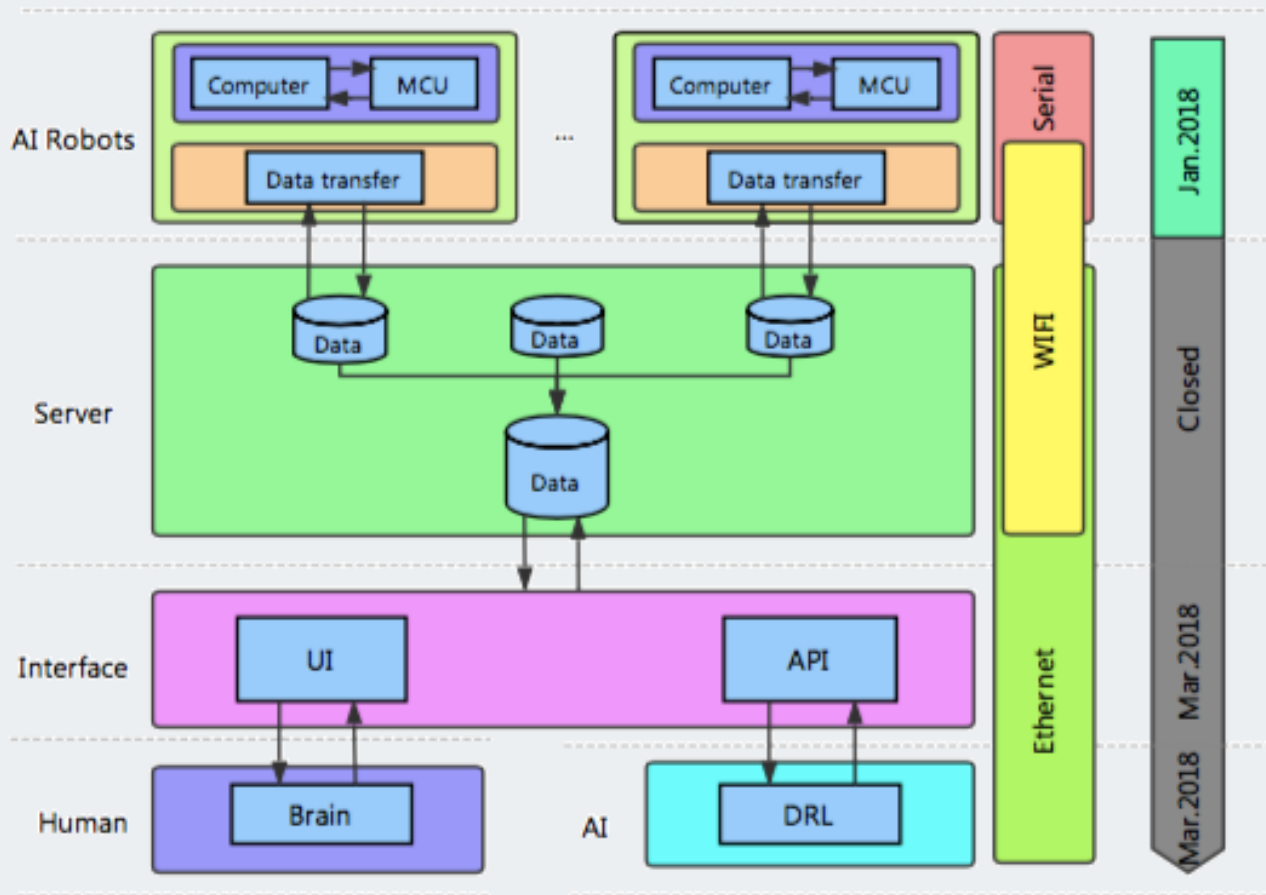
For video demonstrations please visit:
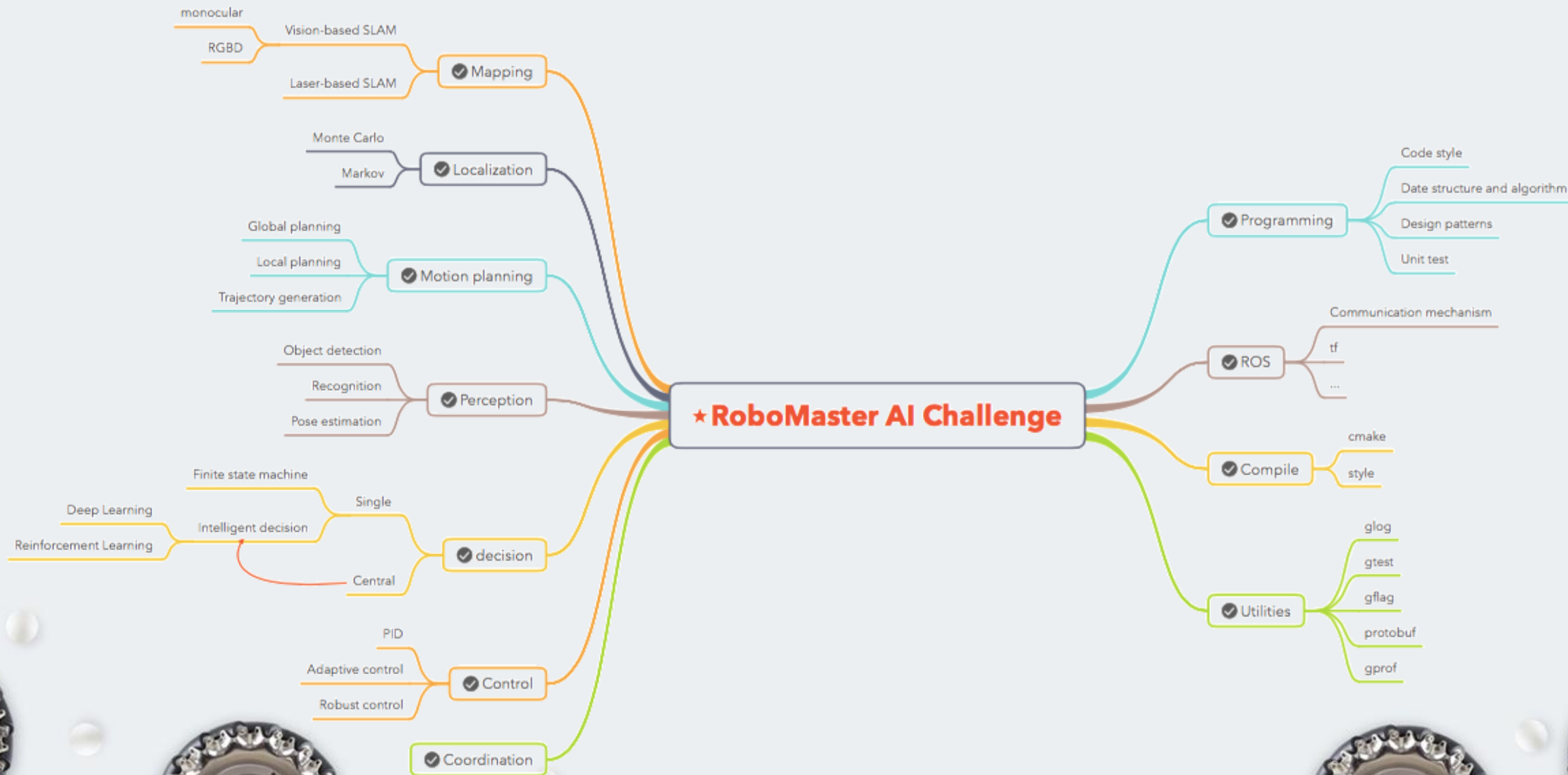https://drive.google.com/open?id=1Pk5mjTmOATr6si5E-TH-FOS4yyn0R_qC

Hardware Architecture of Robots

Technical Requirements

AI Challenge Registration

HOW   Establish a team of 1-10 members

WHO   Undergraduate and Graduate students who research in AI-based technology and enjoy competition and challenge

WHEN   Dec 1 – 31, 2017

WHERE   Visit the RoboMaster official website
https://www.robomaster.com/en-US/user/login

AI Challenge Schedule

Dec 1 – 31, 2017   Registration and Technical Proposals Submission

Jan 8 – 10, 2018   Entry Lists Announced

Apr 8, 2018   Technical Report Submission

Apr 18, 2018   Finalists Announced

May 21 – 25, 2018   Competition in Brisbane, Australia

Registration Benefits

- **ONE** free RoboMaster Standard robot kit for each team that registers for the RoboMaster AI Challenge and has been approved through the Technical Proposals Assessment

*for assessment standards please refer to the *DJI RoboMaster AI Challenge RuleBook*

- **US $1,000** travel sponsorship for each team that passes the Technical Report Assessment

*for assessment standards please refer to the *DJI RoboMaster AI Challenge RuleBook*

- **Free shipping** for all purchased DJI items

- **Internship** opportunities at DJI

AI Challenge Prizes

- **Champion: US $20,000**, DJI products and certificates

- **Runner up: US $10,000**, DJI products and certificates

- **Third place: US $5,000**, DJI products and certificates

- **Finalists:** certificates and gadgets
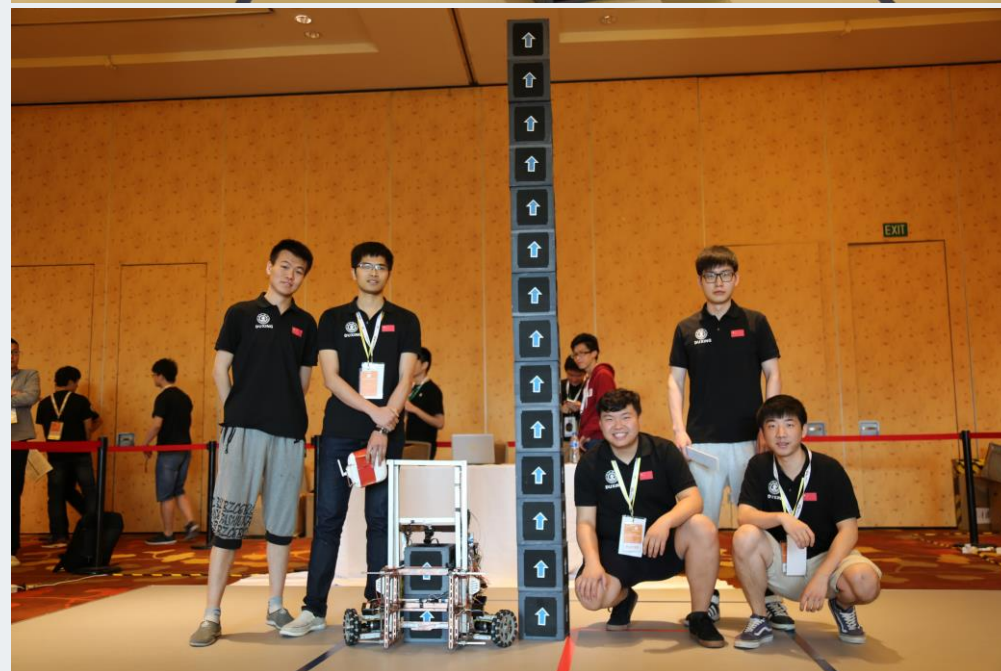
ICRA2018 DJI RoboMaster AI Challenge
Apply Your Knowledge. Become a Champion.

Contact RoboMaster
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