Imperial College London

Mars Rover

Project introduction

2021-2022

Adam Bouchaala and Esther Perea Borobio

Gentle reminder

1. Please mute your microphones during the presentation

2. Questions will be answered at the end. You can write them in the chat

3. Raise your hand to ask a question

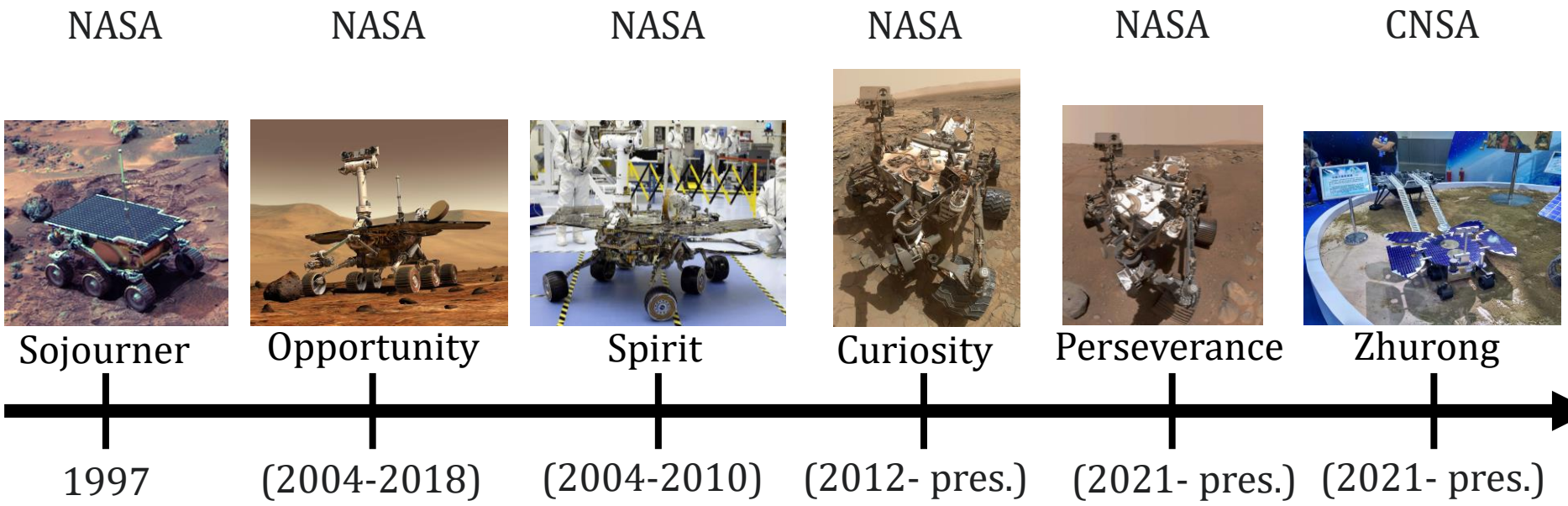
Outline

1. Module context
2. History
3. Mars rover
4. New Skills
5. Timeline
6. Support available
7. Work in the lab
8. Deliverables

1. Module Context

- Make use of the lab skills you have acquired during this year.
- Build a multidisciplinary project composed of different subsystems.
- Learn how to manage the different technical tasks.
- Work in a mixed group (EEE and EIE)

2. History



https://en.wikipedia.org/wiki/Mars_rover

The challenge!

Open-ended project

- Open-ended tasks have more than one right answer, solution or outcome and can be completed in more than one way.

- ✓ Encourage student-to-student interaction patterns
- ✓ Elicit more complete and more complex responses
- ✓ Allow students to give knowledgeable answers
- ✓ Encourage students to question themselves, their classmates, and their teachers
- ✓ Stimulate further thought and exploration

The specifications

Functional requirements – the rover must:

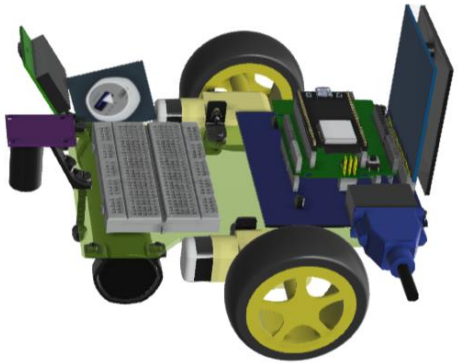
1) Navigate quickly around a test arena (Mars!)
2) Identify aliens and build a map with their positions.
3) Avoid aliens and their underground infrastructure.
4) Have a system for powering using solar energy.

Non-functional requirements – the rover must be:

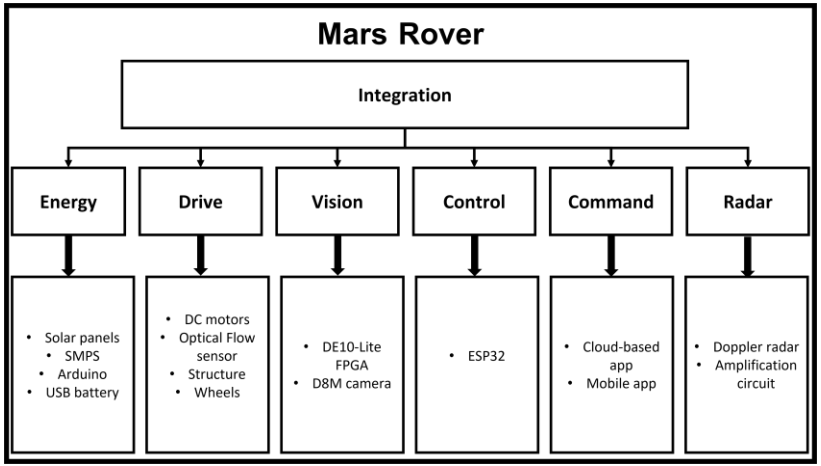
1) Robust and reliable
2) Easy to use

3. Mars Rover

The aim of this project is to design and build an autonomous rover system that could be used in a remote location without direct supervision.



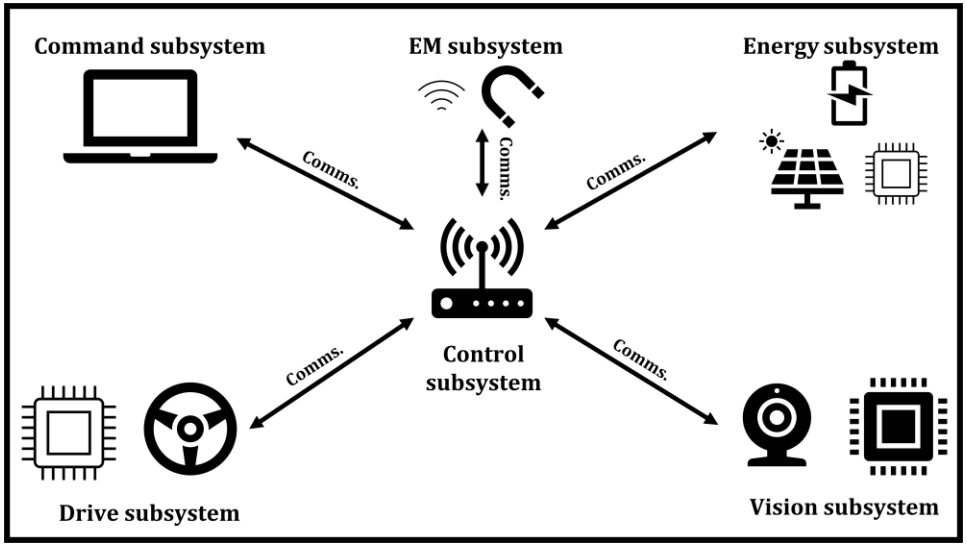
A 3D overview of the Mars Rover



A block diagram of the Mars Rover subsystems

Subsystems

- This project consists of 6 subsystems.
- To be undertaken in groups of 7.
- Project allocation is internal.
- All subsystems should be connected to the system's control unit.



4. New Skills

Project management

Complex systems engineering

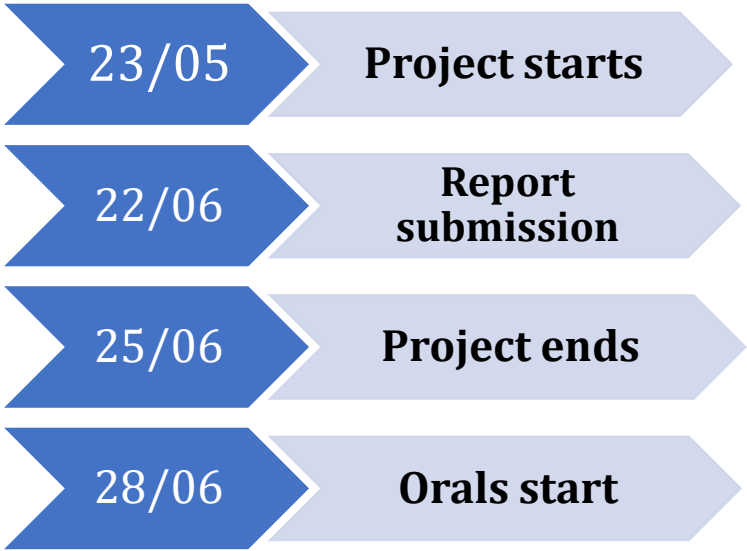
Top-down approach

Documentation

Group work

Problem solving

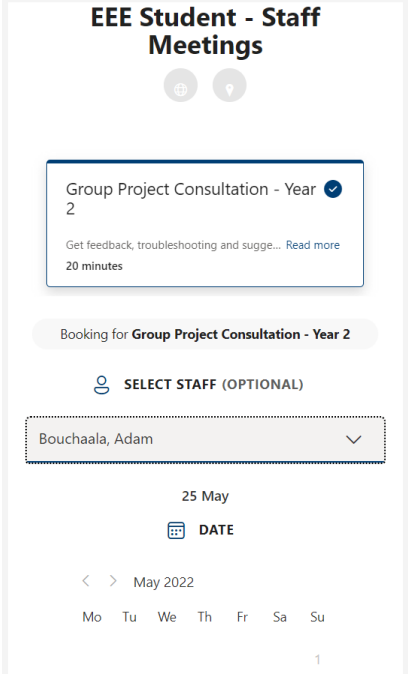
5. Timeline


23/05
Project starts
22/06
Report submission
25/06
Project ends
28/06
Orals start

6. Support available

- Booking system: Link

- Post on Teams: 2nd year summer project -Mars Rover 2022



7. Work in the lab

- Year 1 and Year 2 are working on group projects this term
- 64 groups in total, 34 group benches are available
- Book a lab bench for a half-day session here: EEE Project bench booking 2022

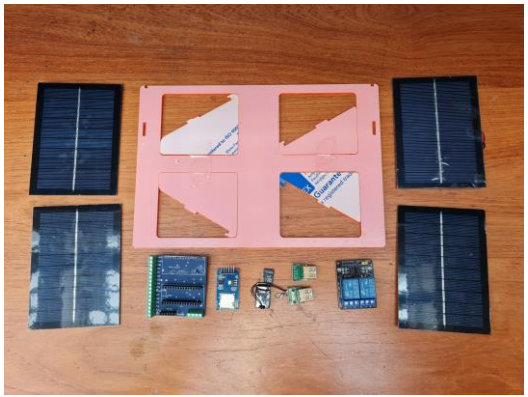
8. Deliverables

- A technical report (15 pages – 6000 words): **22nd of June: (50%)**
- Live demonstration and competition: **28th of June : (25%)**
- Interview: **28th of June : (25%)**

One mark for the whole group

Mars rover kits

Rover kit



Energy kit

Radar sensor

Questions?