Venus Exploration

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Venus – A mysterious planet...
Venus Exploration – Exploring the planet surface
Venus Planet – Craters on the Lavinia Planitia

Danilova Crater
Diameter: 47.6 km

Howe Crater
Diameter: 37.3 km

Aglaonice Crater
Diameter: 62.7 km
Venus exploration
Assignment

- Use robots to find rock samples scattered on the planet
- Collect all rock samples in the lab

Constraints
- Robots cannot climb mountains
- When a robot falls off a cliff, the robot is lost

Objective
- Team that collects the largest amount of rock samples in the least amount of time is the winner
- Maximal time 8 minutes
Terrain

- Terrain boundary marked with black tape
- Cliffs marked with black tape
- Hills are large objects that
  - reflect ultra-sound
  - absorb most infrared light
- Rock samples
  - reflect infrared light (~2*2*2 cm)
- Lab
  - squared container (20 cm x 20 cm x 2.5 cm)
  - ramp (angle less than 30 degrees) available on one side
Robot

- Arduino robot kit
  - gripper kit
  - ultrasound distance sensor
  - digital encoders on both wheels
  - ZigBee wireless communication
Material

- List of material per team
  - 2 robots
  - 2 USB cables
  - 2 ACDC 7.5V power supplies
  - 10 AA rechargeable batteries
  - 2 battery charger

- All material must be returned in the same state as it has been received
- Any components added by a team must be removed
- Nothing may be soldered or otherwise permanently connected to the robot
Material

- List of material per team
  - 2 robots
  - 2 USB cables
  - 2 ACDC 7.5V power supplies
  - 10 AA rechargeable batteries
  - 2 battery chargers
  - 1 vinyl floor element and a ramp (to create your own planet)

- All material must be returned in same state as it has been received
- Any components added by a team must be removed
- Nothing may be soldered or otherwise permanently connected to the robot
- Vinyl floor surface differs from the actual planet surface

Course website:
http://www.es.ele.tue.nl/education/oo2
Grading

- **Design report** (week 2) - 15% of the final grade (before May 2\textsuperscript{nd}, 11:59 pm)
  - Problem statement and key challenges
  - system-level description of proposed system
  - detailed specification of the components
  - test and integration plan for components and system
  - detailed planning of the design and development process

- **Video presentation/demo** (week 8) - 15% of the final grade (before June 20\textsuperscript{th}, 11:59 pm)
  - demonstrate your design
  - explain design concept and motivate main design decisions

- **Final report** (week 8) - 70% of the final grade (before June 20\textsuperscript{th}, 11:59 pm)
  - description of system-level design
  - description of all components
  - discuss the integration of components
  - results from tests carried out to verify the correct operation of the system
Team reports and individual reports

- Design and final report consists of a team part and an individual part
  - team part covers technical aspects
  - individual part covers your contribution (both technical and non-technical) to the system
  - critical reflection on your own actions and role must be included in the individual part

- Check [http://www.es.ele.tue.nl/education/oo2/grading.php](http://www.es.ele.tue.nl/education/oo2/grading.php) for all requirements

- Reports must be submitted on-time through Canvas
Project teams

- Teams are formed by the space agency 😊
  - We have formed the teams randomly for you

- Each team has a tutor (project manager specified by the space agency)
  - Non-technical
  - Project management and organization
Team meetings

- There are lecture rooms (all over the campus! 😁) assigned to each team for two physical on-campus meetings a week:
  - Wednesdays 13:30 - 17:15
  - Fridays 8:45 - 12:30

- All rooms have capacity of more than 11 persons according to COVID-19 social spacing regulations except MF 04 (which has 9 persons capacity)

- Arrange between yourself within the team about physical and/or virtual meetings
  - Try to provide flexibility

- Online discussions with instructors during your on-campus or online meetings

- Links to MS Teams meetings per team are already on Canvas
Equipment delivery

- The robots will be available for you via your lockers.

- Contact TA for any hardware problem regarding the robots
  - TA: Pantelis Katsis (Email: p.katsis@student.tue.nl)
  - TA: Vasilis Ligdas (Email: v.ligdas@student.tue.nl)

- Use lockers for any hardware exchange with TA.

- There will be a Whatsapp group for direct and efficient contact with TAs.
Lockers

- Lockers available for all groups

- Lockers are located in the cabinets on the first and second floor in Traverse building (west wing)

- One member of each team visits the TA (Pantelis or Vasilis) on Friday 23rd of April, 9:00AM - 09:30AM, at the main entrance of Traverse building to pick up the access cards.

- The hardware components (Robots, ...) are already in your lockers.
KEEP YOUR ROOM CLEAN
NO TAPE ON THE FLOOR, TABLE OR ANYWHERE ELSE.
USE THE VINYL FLOOR TO TEST YOUR ROBOT