Venus Exploration

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

- **Howe Crater**
  - Diameter: 37.3 km

- **Danilova Crater**
  - Diameter: 47.6 km

- **Aglaonice Crater**
  - Diameter: 62.7 km
Venus Exploration – Exploring the planet surface
Assignment

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

Constraints
- robots cannot climb mountains
- when a robot falls of a cliff, the robot is lost

Objective
- team that collects largest amount of rock samples in 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 20cm 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 charger
  - 1 vinyl floor element (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
Grading

- **Design report** - 15% of the final result (before September 15th, 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** (week 8) - 15% of the final result (before October 22nd, 11:59 pm)
  - Demonstrate your design
  - Explain design concept and motivate main design decisions

- **Final report** (week 8) - 70% of the final result (before October 24th, 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
Grading

- 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 through Canvas
Support resources

- Project website
  http://www.es.ele.tue.nl/education/oo2

- Online discussions with instructors during your on-campus or online meetings (links to MS teams meeting per team are already on Canvas)

- OGO lockers available for all groups
  - One member of each team gathers the badges of all members and visit Martin Roa Villesscas (email: m.roa.villescas@tue.nl) on Thursday 9:30AM -10:00 AM at the main entrance of Flux.
  - Martin will program the lockers.
Equipment

- 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)
  - Use lockers for any hardware exchange with TA.
Teams and rooms

KEEP YOUR ROOM CLEAN

NO TAPE ON THE FLOOR, TABLE OR ANYWHERE ELSE.

USE THE VINYL FLOOR TO TEST YOUR ROBOT