OO – Venus Exploration

Sander Stuijk
Venus Exploration – A mysterious planet…
Venus Exploration – Craters on the Lavinia Planitia
Venus Exploration – Exploring the planet surface
Venus exploration
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 all rock samples in least amount of time is the winner
- maximal time 8 minutes, 2 minutes penalty per rock left on planet
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
- lab
  - squared container (20 cm x 20cm x 2.5 cm)
  - ramp (angle less then 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 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
Grading

- design report - 15% of the final result (before May 7, 11:59 pm)
  - 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 June 22, 11:59pm)
  - demonstrate your design
  - explain design concept and motivate main design decisions

- final report (week 8) - 70% of the final result (before June 25, 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

- each team member must contribute to both reports
- contribution of each team member must be clearly marked
- contribution in both reports must reflect technical contribution of team member

- reports must be submitted through Canvas
- reports and videos are subject to peer review
  - each student must review 1 design report, 1 video, and 1 final report
  - reviews are due one week after the submission deadlines
  - you will only receive your grade for 5XIB0 when you submit all your reviews
  - responsible lecturer uses peer reviews as input to determine grade
Grading

- reports and video are peer reviewed on a number of different criteria
- each criterion receives a relative score
  - 2 points – reviewed report is better compared to your own report
  - 1 point – reviewed report is equal to your own report
  - 0 points – reviewed report is worse compared to your own report
- score is computed over all criteria through standard averaging
- score of each team is normalized with respect to all teams
- highest and lowest scored report are graded to map reports of all teams to a grade

<table>
<thead>
<tr>
<th>Design report</th>
<th>Criteria</th>
<th>Ratings</th>
<th>Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Does the report provide a clear problem statement that highlights the key challenges that need to be addressed in this design project?</strong></td>
<td>Better 2.0 pts</td>
<td>Equal 1.0 pts</td>
<td>Worse 0.0 pts</td>
</tr>
<tr>
<td><strong>Does the report contain a clear discussion on the system-level design of the system including a discussion on the trade-offs that have been made for each component in the system? i.e., the system level description of the system should consider multiple different scenarios including possible fault situations.</strong></td>
<td>Better 2.0 pts</td>
<td>Equal 1.0 pts</td>
<td>Worse 0.0 pts</td>
</tr>
<tr>
<td><strong>Does the report contain a clear and concise description on the working of each component in the system including a clear definition of the interfaces of each component? i.e., after reading the discussion on the components you should be able to assess whether all components can successfully be interconnected.</strong></td>
<td>Better 2.0 pts</td>
<td>Equal 0.0 pts</td>
<td>Worse 0.0 pts</td>
</tr>
<tr>
<td><strong>Does the report contain a clear and realistic test plan? i.e., a test plan should define tests (and expected outcomes) for testing the components as well as a series of tests that define how the component integration is tested. Note that the test plan does not have to define the time at which the tests are executed (planning).</strong></td>
<td>Better 2.0 pts</td>
<td>Equal 1.0 pts</td>
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keep in mind
  - helping other teams with a high score does not work
  - helping yourself by scoring others low does not work
Support resources

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

- teaching assistant office hours
  - Wednesday 15.00-16.00
  - Wednesday 16.00-17.00
  - Friday 10.00-11.00
  - Friday 11.00-12.00

- OGO lockers available for all groups
  - Robinson Medina will come to your OGO room today to program a locker for your team
Equipment

- each team must collect equipment in Flux 8.096 on Wednesday (April 25th) 15.00-17.00
Teams and rooms


KEEP YOUR ROOM CLEAN

NO TAPE ON THE FLOOR, TABLE OR ANYWHERE ELSE