Final Project
Programming for Engineers
Winter 2015

Andreas Rau, Saarland University
The Final Project

• Groups of 2 Students

• Design & Implement a Complete Arduino Project (Hard & Software)

• Deadline: Tuesday, March 1st

• Grading based on
  ★ originality
  ★ complexity
  ★ functionality
Overall Grading

- Project 25%
- Exercises 25%
- Exam 50%
  (must be passed successfully)
Licht-Uhr
Murat Güner, Maximilian Junk, Pierre Kehl und Thomas Kreis
What we expect...

- Proposal (2-3 Pages)
- Overview, Motivation
What we expect...

- Proposal (2-3 Pages)
- Overview, Motivation
- Hardware Requirements

### Hardware Requirements/List

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
<th>Pieces</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a</td>
<td>Ultrasonic Sensor</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>2b</td>
<td>6 Axis acceleration sensor</td>
<td>7.73</td>
<td>1</td>
</tr>
<tr>
<td>2c</td>
<td>Electronic Speed Controller (ESC)</td>
<td>22.23</td>
<td>4</td>
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<tr>
<td>2d</td>
<td>LIPO battery</td>
<td>34.00</td>
<td>1</td>
</tr>
<tr>
<td>SUM</td>
<td></td>
<td>130.96</td>
<td>1</td>
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</tbody>
</table>

*a bare package - no order required*

*http://www.amazon.de/gp/product/B00D1K5Z5Q*
What we expect...

- Proposal (2-3 Pages)
- Overview, Motivation
- Hardware Requirements
- Use cases

3 Contracts

3.1 Use case scenario
Drones have multiple purposes and can carry a lot of equipment and sensors on board for a fairly short amount of time. Using it to measure temperature conditions in remote destinations is possible without setting up a central weather station. Thus, we can overlook a large amount of places ...

Our drone allows it to enter a set of GPS coordinates and the drone automatically reaches its destination; takes a picture and records the current weather conditions.

3.2 Must-Haves
- The drone can fly
- Webinterface allows setting of a course on google maps coordinates
- Photographs are possible and can be transmitted wirelessly to a central storage
- I can hover without changing the position

3.3 May-Haves
- The drone measures the temperature, humidity, and atmospheric pressure
- Webinterface allows recording of videos
- Automatic fly back
- I can hover without changing the position

3.4 Must-not-haves
- No collision detection, e.g., overland power lines, birds
- No weather resistance
- No power supply measurements
What we expect...

- Proposal (2-3 Pages)
- Overview, Motivation
- Hardware Requirements
- Use cases
- Must/May/Must-Not haves

3 Contracts

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Project

- Originality: ⭐⭐⭐⭐⭐
- Complexity: ⭐⭐⭐⭐⭐
- Functionality:
  Checked Against Contracts
Project

- Originality: 
- Complexity: 
- Functionality: 

Checked Against Contracts

REJECTED
What can I use?

- Chair can buy hardware for 10 Euro per group (no reimbursement)
- all hardware from previous projects
- wood/metal constructions
- be creative
Delivery

• Deadline: 1st of March
• Video
• Group Presentation
Delivery

• Deadline: 1st of March

• Video

• Group Presentation

• Circuit Diagram/Design
Delivery

- Deadline: 1st of March
- Video
- Group Presentation
- Circuit Diagram/Design
- Well Documented Code
- Final Document
Final Document

- Extend Your Proposal
- Discuss Design Decisions
- Occuring Problems
- Present Your Circuit/Code
Demo