

Logbook

Weekly Report

1st Week Report

Week one, team three was assigned the Didactic Robot Fish Kit for a project. Shortly after, the team had their first meeting with the project advisers. The two primary advisers for this project are Manuel Silva and Pedro Guedes. With Manuel and Pedro the team began to discuss possible directions in which to take to project. Team members then went on to research possible solutions on their own.

2nd Week Report

In the second week, we defined the different tasks of the project and created a Gantt Chart to have a structured and neat schedule for the further course of the project. In addition, we started the research regarding educational programming languages, fish movement, waterproofing and possible controller boards. Besides, first chapters were added to the report.

3rd Week Report

During the third week, the team began to research suitable controller boards that are available for use with our robot. We compared many important aspects of the boards that were then created in a table format to establish the best choice. Furthermore, the Gantt Chart that had been created in the previous week was updated to ensure that all details of our work plan had been highlighted in a clear and structured format. Finally, we initiated working with the Blockly programme to familiarise ourselves with the programme and obtain a basic understanding of how it works.

4th Week Report

-Easter Holiday-

5th Week Report

In the fifth week, we have reconsidered the idea of use Ardublock instead of Blockly. We have realised that using Ardublock is going to be easier for kids. We have looked for the price of some components such as servo motors or arduino boards, and we are awaiting a response about which kind of sensor we can use underwater. We still haven't got the license of Solid Works, so we have decided to start drawing the model in Autodesk Inventor or Siemens NX 10 because we already have the license of this programmes.

6th Week Report

In the sixth week, we started to edit the source code of ArduBlock to create our custom programming language. Simultaneously, the chapters 'Project Management', 'Eco-efficiency Measures for Sustainability' and 'Ethical and Deontological Concerns' were written. In addition, we began to create the 3D Model of the Fish to get an impression of the final size.

7th Week Report

In the 7th week, we added some new components to the list of material and also chose the final providers. To power the servo motors, we created a transformation module to transform the 9 V of the batterie to 5 V. We appended this module to the electronic schematics. In addition, we made some advances in modeling the 3D model of the fish. Furthermore, a logo was created and we started to create the presentation for the interim presentation.

8th Week Report

In the eighth week, team 3 completed their interim presentation to their peers and supervisors. Therefor the weak was primarily spent practicing and perfecting the presentation, condensing half a semester of work into a ten minute exhibition. The group received feedback from their advisers on both the interim report and presentation, focusing their attention on what work is still required.

9th Week Report

Team 3 spent their ninth week revising their interim report. With the feedback they received from their advisers, the team edited and revamped the report, turning in a final copy on Friday April, 29th.

10th Week Report

-Student Week-

11th Week Report

During this week we focus our work on closing the list of materials to start building the prototype. The list was nearly closed before the meeting with supervisors except servo motors and battery, as we made a number of design changes that reduced the number of servo motors would we need. Once approved modifications to the project, we closed the list to have the material next week and start building.

Meetings

1st Meeting (2016-02-25)

Agenda:

1. Presentation
2. Modus operandi
3. Project proposals
4. Electronic Logbook

Minute:

All ISEP EPS teams met with the project advisers to discuss the various project proposals and their requirements.

2nd Meeting (2016-03-03)

Agenda:

1. Marketing

- Target child age range
- Selling to parent vs. child
- Other potential markets
 - Schools
 - Summer Camps

2. Physical Model

- Water proofing
 - Vapor treated ABS
 - Wax Coated

3. Programming

- Hardware
 - Arduino
 - Teensy
 - Launchpad
- Programming Interface
 - Visual
 - Text Based

Minute:

Manuel Silva and Pedro Guedes are primary advisers. Design objectives and constraints should be established prior to design decisions.

3rd Meeting (2016-03-10)

Agenda:

1. Which materials are included in the budget? 3D-Printer Material?

2. Actual size of the fish

3. Preliminary list of material

* <https://drive.google.com/file/d/0B6q8nhwDS0QBNFdsMnAxWU95a1E/view?usp=sharing>*

4. Feedback for the Gantt Chart

5. Methodes to make the Fish waterproof

6. Communication between Arduino and Processing? (Serial connection)

Minute:

- Start updating report in Wiki
- Modify Gantt Chart
- Too early to be picking materials
- Will be charged for 3D printed plastic included

4nd Meeting (2016-03-17)

0.0.1 Educational programing languages

1. Is it possible to change the Scratch open source code to create our own custom language based on Scratch.

0.0.2 Modeling / 3d printing

1. Does it matter what software we model in/are any available through the university?
2. What type(s) of plastic and 3D printing are available to us?

0.0.3 Documentation

1. What are the principles of the report in matters of quotation.

0.0.4 Movement

1. Different techniques to make the Fish move and turn

Minute:

- Custom programming in Scratch is possible, maybe look further into Blockly
- Stereolithographic printing available
- SolidWorks licences should be obtainable
- Proper citation demonstrated

5th Meeting (2016-03-31)

Educational programming language

1. We are going to use a modification of Blockly.
2. For the communication between Blockly and Arduino we are thinking about using node.js or socket.io. But to make a final decision it is necessary to do some tests.

Code Testing

1. When and where can we gain access to arduinos and their hardware to test code?
2. Do you know if there is a IR sensor we can test underwater in the excess hardware?

Modeling Software

1. We discussed the availability of SolidWorks licenses before break. How do we obtain these?

Materials

1. Local electronics suppliers we can look to
2. Potential reliable Arduino clones
 1. Nano V3.0
 2. Iteaduino

Minute:

- **Local suppliers:**
 - Botnroll
 - RS Components
 - Mouser Electronics
 - PT Robotics
 - Lusotronica
 - Aquario

- Consider use ArduBlock instead of Blockly
- Change the table labels
- We need a 9V battery
- Calculate the centre of gravity

6th Meeting (2016-04-06)

Licensing

1. Is there anything we have to consider regarding legality if we are going to make and publish a custom program based on ArduBlock?

Materials

1. Use PLA as the material for print the pieces with the 3D printer.
 1. Do we have PLA on hand. If so cost to buy from university?

3D Printing

1. Support material
 1. Are available 3d printers single or dual extrusion?
 2. If single, is there an adviser who can give advice on support material design?

Minute:

- ArduBlock is, according to [ArduBlock download site](#), provided under a [GNU General Public License version 3.0 \(GPLv3\)](#) license. Please read it and draw your conclusions.
- We should not forget about the resistors for the LED.
- Do calculations for the power supply.
- Check if the Arduino is powerful enough to power all 3 servo motors.
- Add captions for the tables and lists in the report

7th Meeting (2016-04-13)

1. Presentation of the current status of the 3d model and the software
2. We need help finding a waterproofed switch from on local provider
3. To run both RGB LED in a parallel connection we need 3 extra resistors. Alternatively we could use a RGB LED with 6 Pins. Do you know any local provider?
4. Besides the necessity of drivers, do you see any problem using the cheap [Arduino Nano Clone](#) instead of the [expensive original Arduino](#)?
5. Feedback on the electrical calculations as we were unsure exactly what you were looking for.

8th Meeting (2016-04-27)

1. The numbering in the bibliography start at 1 for citations in the development part. Can you

have a look at it?

2. We added a voltage transformer to the electronic schematics to power the three servo motors. Is it working this way or is it necessary to use an capacitor?
3. We added some more precise informations to the planning of the prototyping phase, as can be seen [here](#). Can you give some feedback to this planning?
4. Exact distinction between motivation, problem, and objectives. Are they currently correct?
5. What exact information is required to reference a particular website?

Minute

- The reference must be below the sentences, before the dot.
- Is not a voltage transformer, is a voltage regulator.
- Search about the voltage regulator that Paulo suggested:
 - LM2596 step down (botnroll)
 - LM2575 to -220
- Think another name, Coduino is almost used
- The sponsori s IT-SECTOR
- Close down the materials list

9th Meeting (2016-05-12)

- We are considering change the design to include a single rear fin without the two lateral fins, primarily for the cost saving.

1. Cost Saving
 1. 2 less servos
 2. No need to waterproof servos
 3. Single power source/no voltage regulator
2. We are concerned about reduced mobility/turning radius, but hope to use the caudal fin's full 180 degrees of motion to allow turns
 1. The fish's center of mass will be very close to the applied force: small moment
 2. With space and cost savings, we can use a larger servo with more torque
 3. We are thinking about using the TowerPro SG5010
 4. The project description only require 1 DOF. So if it doesn't turn well, it will still meets requirements (but is kind of boring)

- Do we have access to a set of hole taps? You can print threads, but it is much easier to add them manually, especially for holes of this size.

Minute

- Look for a charger for the battery.
- Think about the connectors.
- Close down the list of materials.
- Consider other material more flexible for the back fing.
- Take a preview of DF15 servo motor for our list.

10th Meeting (2016-05-19)

1. Do we get a webservice for the website?
2. After successfully testing the electric prototype, should we solder all the cable to the board?

Minute

- We can adopt 3 solutions:
 1. ave.dee.isep.ipp.pt
 2. Google account
 3. Isa.isep.ipp.pt
- The connectors should be easy for kids, so solder the cables is not the best solution. Also think about which type of connectors we need

11th Meeting (2016-05-25)

NA

12th Meeting (2016-06-02)

1. Are our parts printed?
2. Casa Dos Vedantes does not sell sheet rubber, only string. It may work, but not what the fist was designed for.
 1. Reprint bottom half of fish
 2. Find somewhere that sells sheet
3. How do we get material on hand that could be repurposed for the fin

Activities

Please register here all project activities

| Start | End | Task | Description | Who |
|-------|-----|------|-------------|-----|
| | | | | |

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