CS5041 – Practical 1 – Phidgets (Tangible/Physical Computing)

Summary, Dates and Details

This practical consists of a programming exercise, a short report, and a demonstration. The practical is due on October 8th 2015 (21:00). The demo will take place during the lecture time on the same day. This practical accounts for 15% of the module grade.

The Good Academic Practice policy applies (https://www.st-andrews.ac.uk/students/rules/academicpractice/). Lateness penalties follow the default School policy (http://info.cs.st-andrews.ac.uk/student-handbook/learning-teaching/assessment.html#lateness-penalties).

Goal

The main goal of this practical is to get you started with physical computing and programmable interfaces that can modify the physical world beyond a screen. At the same time, you will get to practice basic programming, and quickly refresh your knowledge on interactive architectures in preparation for the GUI set of lectures.

Requirements

Part 1 – Basics

In part one you will use the small Axteroids program that you have already seen in the tutorial, and convert it into a physical device. For that, you will have to adapt the input of the program to work with Phidgets. If you were not able to attend the tutorial, try to do the tutorial by yourself and then contact the instructor.

The minimum requirement is that you modify Axteroids so that it can be completely controlled with Phidget input.

Part 2 – Modifications

As an extension you can use any combination of phidgets included in your hardware kit to provide extended functionality of the software. For example, you can program shooting, changes of colour, etc. Additionally, you can use the servo motor in any way you see fit. The foam board included with the hardware kit and the push pins will allow you to create a dashboard for the control of the ship (and any other objects that you'd wish to add to the program) that is more stable than the loose devices.

Feel free to combine any of the elements in any way you want, with the only restriction that the hardware itself should not be destroyed (except for the foamboard, which you can change and shape as you want). If you are unsure about whether something is OK, ask your instructors.

Assessment

Coursework will be marked in accordance with the mark descriptors given in the School's handbook (http://info.cs.st-andrews.ac.uk/student-handbook/learning-teaching/feedback.html#Mark_Descriptors). More specifically, an acceptable practical will use Phidget input to control the ship, at least speed, and direction. A good implementation will have a range of alternative inputs and outputs. A very good practical will use a set of inputs and outputs in a meaningful way that allows people to control the ship with great efficiency and precision, or with a lot of fun, and add new elements to the game. An outstanding practical will do all of the above and justify the choices in terms of existing work in HCI that has not been provided in the lectures.

Deliverables

The students will demo their software/hardware to the instructors, and deliver a report of maximum 1.5 pages in the format included as a template (double column ACM format). The report must contain a clear and brief description of the final version of the interface, highlighting the good things about it. Graphical media (photos and short videos) are encouraged. On a different section add a short commentary on the technology. A technical and theoretical justification of the choices is optional. We encourage brevity. You should also submit a zip with your final version of the code, although you will not necessarily receive written feedback on the quality of your code.