Optical

R C Seals
University of Greenwich
Dept Electrical, Electronic &
Computer Engineering,
Chatham Maritime,
Kent ME4 4TB
R.Seals@gre.ac.uk

Abstract
In this paper the structure of a community art installation is described, based around an array of tri-colour LEDs, designed to inspire and excite Learners from a number of local schools.

Keywords
Light installation, community art

Introduction
This is an installation of 66 pseudo-randomly flashing variable colour inter-active glowing orbs, arranged as a 11 x 6 grid on a flat surface. Each orb is 5 x 5 x 5 cm with spaces between them, to produce a panel approximately 800 x 450 mm in size. Each orb has a rounded translucent white plastic thermo-moulded cover in order to disperse the coloured light output with the widest possible viewing angle. Inside each cover is a printed circuit board (PCB) containing a microcontroller, a tri-colour light emitting diode (LED), a light sensor and a Bluetooth digital communication link. The microcontroller has been programmed to flash the LED with pseudo-random intensities, colours and durations depending on the time of day (determined by the light level) and local light variations. Each module will also respond in an interactive way with any detected short term light variations. So for example, when any module flashes then all the adjacent modules will detect this and respond in a sort of chain reaction. These detected flashes result in further increases in flashing and intensity rates until a crescendo of flashing is reached, which then decays away until stimulated again. A Bluetooth link is implemented allowing some smart phones to communicate with individual orbs enabling the flashing to be directly controlled. Each module is completely independent of all other modules, interacting only through detected variations in local light levels. Alternatively, the system can be stimulated into enhanced activity by briefly shining a small torch onto one or more modules.

Anyone with a smart phone is able to communicate with any of the modules equipped with a Bluetooth link to manually control that particular module. The PIN for all modules is 1234. Not all modules contain a Bluetooth link in order to limit interference between them and reduce total power consumption. For Android smart phones the app called Blueterm is an effective

package to use. Once the Bluetooth connection has been made the user is able to communicate with the selected module using text commands entered via the smart phone virtual keyboard, with results provided on the virtual terminal output. With a little bit of practice anyone can master this process.

The system has been developed as a community art installation to encourage interest in electronic engineering among pre-University students as many of them have a negative view of engineering, perceiving it as dirty, boring, dull and difficult. The aim of the glowing orbs is to overcome this bias by appealing to the artistic side of these students along with an affinity to modern media connectedness. Local schools have been attending the Medway campus for Taster Days which included the soldering and testing of their very own glowing orb, along with the Bluetooth link to their own smart phone. These completed modules have then all been gathered together for this final installation. All the school students who have attended a Taster Day have been invited to attend and view the installation during the conference and to connect to their own glowing orb module via their individualised Bluetooth link.

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