

Field Programmable Gate Array based low power multipurpose display board using 3 Dimensional LED Cube

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Abstract: Smart technology is increasingly becoming predominantly used in industrial, domestic and commercial purposes as an alternative to existing technologies. New smart technologies allow the use of advanced techniques in the design of advertising boards as countries are fostering for smart cities. A multipurpose 3 dimensional light emitting diode cube is made using low power and hand soldered blue LEDs to form a volumetric cube design. A field programmable gate array (FPGA) based DE2 Atera board is used to control the display on the cube through a VHDL program written into it. The Cyclone II based processor is used to render 3D effects in conjunction with a graphic user interface (GUI) application running on a standalone computer. Custom effects are run on the cube using the computer as the input interface via the GUI. Communication between the computer and the cube is done using a serial interface that connects the host computer to the DE2 board via a UART protocol

