**Overview**

The aim of this project was to build solution that determine the dominant color for each of screen’s quarters and then displaying the values on 4 RGB diodes connected with STM32F407 board.

**Description**

The solution consist of two independent modules: C++ console application for PC and application for STM32 board. Communication between them bases on the universal synchronous and asynchronous receiver-transmitter (USART).

C++ console application reads RGB values for selected pixels from the screen, based on that calculates average RGB value for each quarter of the screen. Once this is done value for each RGB diode is passed to STM32 board through the Serial Port. Data is read by STM32 board using interrupt handler and then sent to the diodes using GPIO.

**Tools**

System Workbench for STM32

STM32CubeMX (wersja 5.1.0)

**How to run**

To run the solution you need to build C++ application on your PC, build solution for STM on your board and connect the board with PC using USART. Once this is done you can compile console application and using user interface start the transmission.

**How to compile**

Solution can be run using standard C++ compiler.

**Future improvements**

Currently solution calculates average RGB value for each quarter of the screen basing on 4 pixels only. This can be improved however, this require much more sophisticated method of reading RGB value for pixel. Increasing number of pixels checked for each quarter using currently applied methodology significantly increases calculation time (diodes change colors much slower).

**Attributions** –

Configuration of USART was done basing on the learning materials of the Institute of Control, Robotics and Information Engineering (Poznań University of Technology).

**License**

LICENSE MIT

**Credits**

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