

Light monitoring and blinds controlling system

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Abstract of the project

Aim of the project was to create system which could monitor brightness in room and control placement of blinds depending on the mode picked by user from android application. System should monitor brightness in room and then move blinds up and down to get measure which is corresponding to range of brightness in picked mode.

Intermediate Project
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1. Description

Created system was made to enable possibility to control blinds without touching them. Application provides user with five different modes of brightness in room as well as possibility to see current measure from Light Sensor. The application is created for Android Operating System. It contains six buttons responsible for changing modes and one button which is intended for connecting with Bluetooth Module in model. Algorithm for receiving data from application as well as controlling blinds is programmed on Arduino Uno platform. HC-06 Bluetooth module was used for communication between Arduino and application and measurements of brightness were performed by Light Sensor BH-1750.

2. Stages of development

2.1. Bluetooth connection

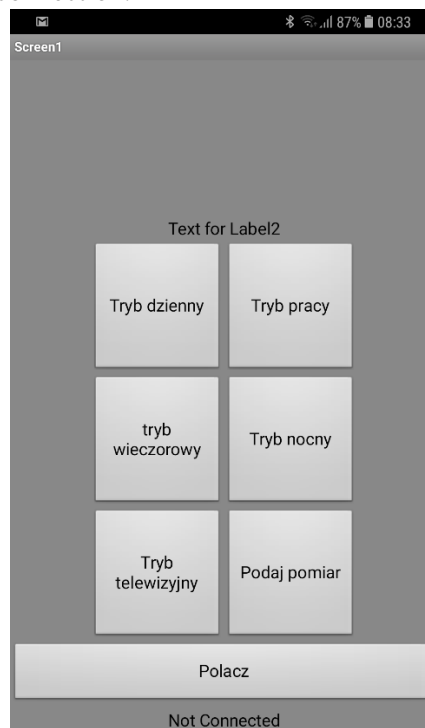
It was necessary to create Bluetooth connection between application and Arduino. To do it server/client architecture was needed. First thing to do was pairing mobile phone with Bluetooth module in model.

2.2. Sending data

Controls so in this case setting appropriate mode is conducted by sending proper values, which are responsible for specific modes, from application to Arduino. Every button in application has it's specific number, by that Arduino knows which mode should be turned on and what should it do to reactive measurement which is within range of selected mode. Data is being send every 500ms that's because of timer which was implemented in application. It is necessary not to set too small interval because the frequency of receiving data by Arduino is limited and because of that we might very slow reactions. The minimum value of delay should be no less then 100ms.

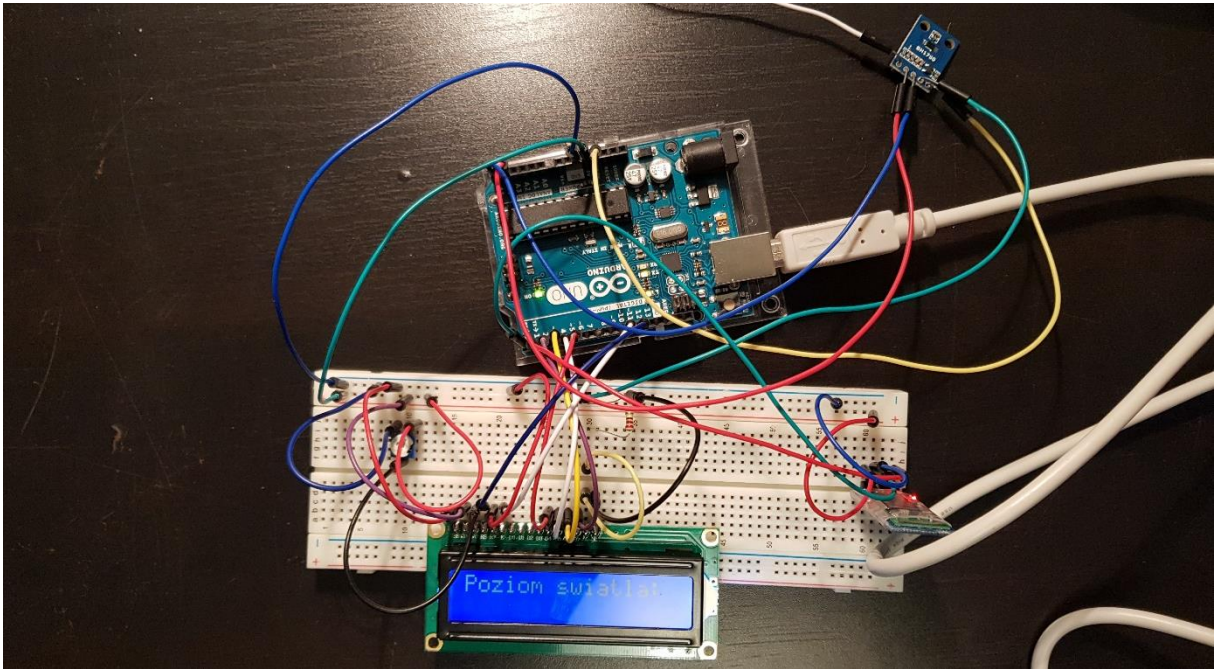
2.3. GUI

The main requirement for GUI was to make it intuitive and as simple as it is possible. Interface contains 7 buttons, 6 of them are responsible for selecting modes and the last one is set for Bluetooth connection.



2.4. Model

To execute fast test special model was created. It consists Bluetooth Module HC-06, Arduino Uno, LCD screen and Light Sensor. On LCD screen we can see measures and how blinds should act when user change modes from one to another. Such model saves a lot of time and is accurate enough to say that algorithm works. Without such model it will be necessary to spend extra money on materials from which could be constructed model which will suit real conditions.



3. Conclusion

After executing several tests the application works good enough. There is a little delay between sending and receiving specific mode but such system does not have to work rapidly. There is no problems with establishing connection between model and application as well as brightness measurements are very accurate. Unfortunately option for creating day plan was not achieved. Model is created without any motors but as it can be seen on LCD screen setting accurate states for real time measures is created and in this moment connecting motors and sending them appropriate sates is needed.