In this regard, in the near future it is necessary to accelerate the analysis of the existing state of polymer waste management in the Republic of Belarus, and the selection of acceptable processing methods (disposal) of these substances.

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SYSTEM OF AUTOMATIC MICROCLIMATE CONTROL AND REGULATION IN A ROOM

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The system of automatic microclimate control and regulation in a room is a system that maintains the necessary air temperature in a room, and regulates temperature changes in a “day-night” and “summer-winter” cycles.

Keywords: automation, microclimate, microcontroller, Arduino, relay.

Nowadays electronic devices play a predominant role in people’s lives. Almost every inhabitant on Earth has a mobile phone in his pocket. What is more, most of them have a smartphone with an Internet access. A person can use a web browser or an app any time to see the weather forecast for today, tomorrow or for the next week. With popularization and intensive development of the Internet and programming technologies people adapted the global network in order to make household routine easier. The examples include smart vacuum cleaners that help to clean a house, waste-picking robots, that simplify the collection of waste in the streets, smart houses with light, curtain, sound system, and TV set controlling systems. All these can be defined by a recently appeared term “ the Internet of Things”. The Internet of Things is a set of things that are connected into one system. The control unit can manage any of the connected nodes. Lessening of our involvement in everyday routine processes has reached such a degree that sometimes we do not take into consideration the radiation emitted by devices. By the way it can be the reason for a person’s feeling bad and for the reduction of life quality. For reducing the negative influence of devices on the people’s health one should follow some basic rules: a room should be regularly ventilated and the recommended air temperature balance should be maintained. Some research were conducted to form the norms of most favorable temperature for a person’s optimal productivity. That’s why there is a need for creating a system that would simplify the microclimate control indoors.

The system components include: a board based on the Arduino Uno microcontroller, a Relay Module with several channels, a resistor of different resistance characteristics. The system control is possible with the help of the Arduino Uno microcontroller. Arduino Uno is a printed circuit board based on the Atmega328P microcontroller (Image 1.). 6 analog inputs, 14 digital outputs, and a 16MHz crystal oscillator are placed on the board. The device can be powered in three ways: via a USB port, via an external power connector, or via a VIN connector.

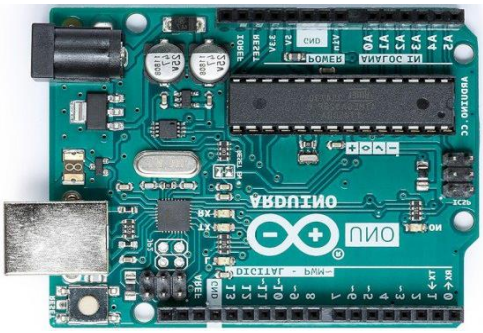

Image 1. – Arduino UNO

A set of DS18B20 sensors is used for measuring air temperature at a particular interval, and the system corrects the work of an air-conditioner using the previously received data.

The Relay Module has several channels, each of them is connected to a resistor of different resistance characteristics. The shift of the channels is possible with the use of a micro program, processed by a microcontroller.

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RGB-HSV CONVERTER IN COMPUTER VISION SYSTEMS

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Color model refers to an abstract model describing the representation of colors as tuples of numbers, usually as three or four values, called color components or color coordinates. Together with the method of interpreting this data, the set of colors of the color model defines the color space.

Keywords: color model, RGB, HSV, RGB-HSV converter.

RGB color space. RGB model is based on the reproduction of any color by adding three main colors: **r**ed, **g**reen and **b**lue. Each channel-R, G or B - has its own separate parameter indicating the amount of the corresponding component in the final color. RGB color space requires a lot of expenses, as the color depth here is high, i.e. 3 channels of 8 bits each, which gives a total of 24 bits.

Since the RGB model is the addition of colors, it is called additive. A *unit cube* is used to represent the *color space* of *RGB* model.

HSV color space. We can describe HSV color space with the help of a hex cone model with three dimensions. H stands for Hue, which varies between 0-360° where red falls between 0 and 60 degrees, yellow falls between 61 and 120 degrees, green falls between 121-180 degrees, cyan falls between 181-240 degrees, blue falls between 241-300 degrees, and magenta falls between 301-360 degrees. S stands for Saturation, which describes the amount of gray in a particular color, from 0 to 100 percent. The larger this parameter, the "cleaner" the color, so this parameter is sometimes called chroma. And the closer this parameter to zero, the closer the color to neutral gray. V stands for Value, which works in conjunction with saturation and describes the brightness or intensity of the color, from 0 to 100 percent. With the increase in the value, the color space becomes brighter and reveals various colors.

A color in one absolute color space can be converted into another absolute color space, and back again, in general; however, some color spaces may have gamut limitations, and converting colors that lie outside that gamut will not produce correct results. There are also likely to be rounding errors, especially if the popular range of only 256 distinct values per component (8-bit color) is used.

$$H \in [0, 360]$$
$$S, V, R, G, B \in [0, 1]$$

MAX — maximum value of R, G и B, а MIN — minimum

$$H = \begin{cases} 0, & MAX = MIN \\ 60 \times \dfrac{G - B}{MAX - MIN} + 0, & \text{if} \quad MAX = R \text{ и } G \geq B \\ 60 \times \dfrac{G - B}{MAX - MIN} + 360, & \text{if} \quad MAX = R \text{ и } G < B \\ 60 \times \dfrac{B - R}{MAX - MIN} + 120, & \text{if} \quad MAX = G \\ 60 \times \dfrac{R - G}{MAX - MIN} + 240, & \text{if} \quad MAX = B \end{cases}$$

$$S = \begin{cases} 0, & \text{if} \quad MAX = 0; \\ 1 - \dfrac{MIN}{MAX}, & \text{else} \end{cases}$$

$$V = MAX$$

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