UDK 001

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CREATION OF SOFTWARE AND HARDWARE TOOLS FOR REMOTE CONTROL OF "SMART HOME" THROUGH SPEECH

Annotation: In this article highlights of creation of software and hardware tools for remote control of "smart home" through speech.

Key words: software, tools, remote control, "Smart home", speech.

Smart home is controlled in several ways: via a remote control, a desktop computer with pre-installed applications. The latest innovation in the world of smart home technology is voice control. It allows the system to respond instantly to your pre-recorded command, and you do not need to search for the remote control and press several key combinations on the computer. The main condition is the presence of built-in microphones in the smart home system. This solution is implemented by Home Sapiens. There's a voice assistant with a female voice named Eva.

A voice-controlled house controls the following subsystems:

- lightings. A voice-controlled system responds to a simple hand clap, finger click, or human voice. Out of all the noise and noise, the built-in microphones recognize the preset sound in the settings and respond only to it. In view of this, it doesn't matter how noisy the room is — the system recognizes the necessary commands;

- climate control. On command, the air conditioner or radiator turns on or off. Operation mode control is provided;

- intercom (relevant for entrance doors or gates). When the smart home complex is given a specific command, it will open or close doors, gates, or even Windows;

- burglar alarm. It will not only react to extraneous sounds, but also turn off at your command.

Manage your Smart home using the Android app

The complex with voice control is controlled using a single word or phrase that is set by the owner of the room on the control panel. It is also controlled manually — the control panel is launched from a computer, as well as from a smartphone and tablet.

The main condition is access to an Internet connection. Not only the keyword or word is set, but also the algorithm of actions of the "smart home" with voice control. Examples of commands include: "Turn on the computer", "Make it warmer". Voice control solves several tasks simultaneously, which is possible as follows:

- you pre-set the system a command, as well as the algorithm of its actions in response to it;

- you give the command "movie mode", and "smart home" at this time turns off the light in the room, closes the curtains and turns on the TV.

Voice control has the following advantages:

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- selecting the appropriate phrase to activate functions;

- the compilation and execution of scripts for multi-tasking teams;

- the purpose of the functions on the timer;

- the same efficiency as when controlling a remote control or keyboard computer (achieved by the ability of the microphone to distinguish the desired phrase from extraneous noise); the

- ability to listen to everything that happens in the house, in real time.

Amazon Echo-voice control system for Smart home

The complex with voice control also has disadvantages, including:

- need to buy powerful microphones;

- the need to set commands that you do not utter in everyday life, in order to avoid false triggering of the system.
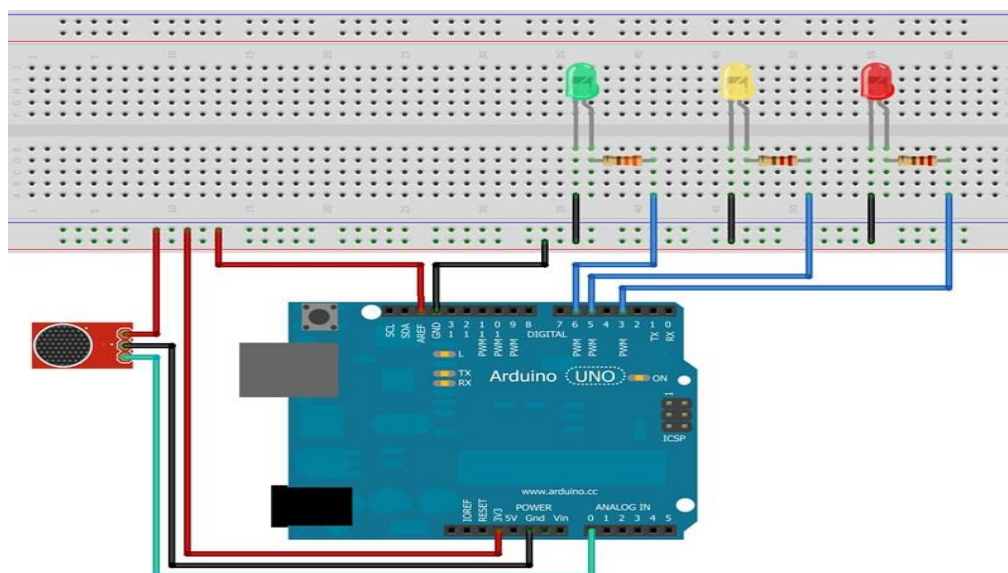
Diagram 1. Speech Recognition with Arduino-voice control

You can equip a smart home with voice control using software products such as:

- BitVoicer. This product runs exclusively on the Windows operating system, which eliminates its use on many devices;
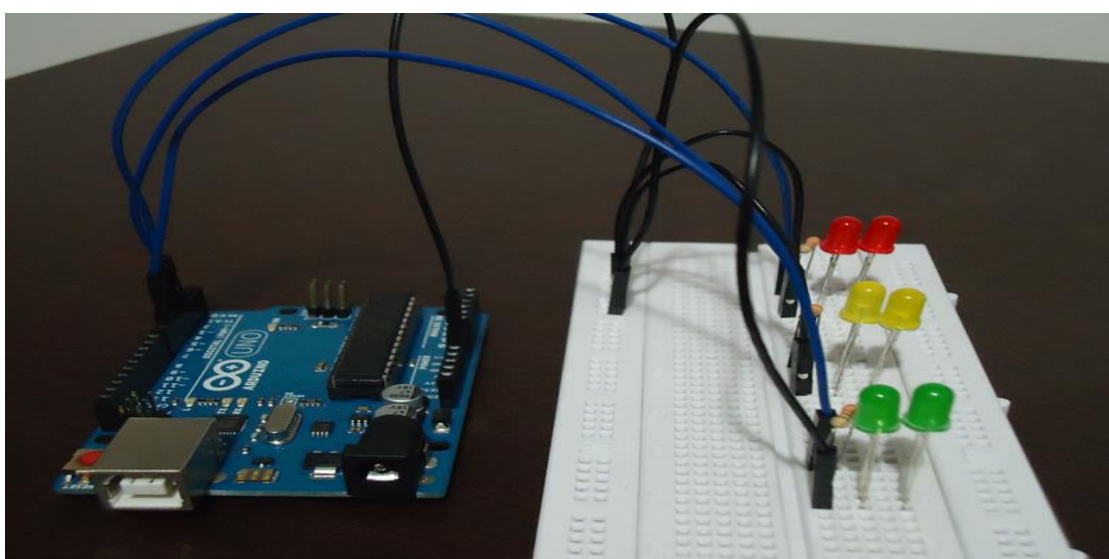

Diagram 2. Speech Recognition with Arduino-voice control

- Arduino Voice Recognition. It is a proprietary device for recognizing voice commands from the Arduino company. Among the disadvantages, experts note a limit on the number of commands, a long process of learning how to manage the system, as well as the need to flash the device to record new phrases, which is inconvenient with the existing debugged complex;
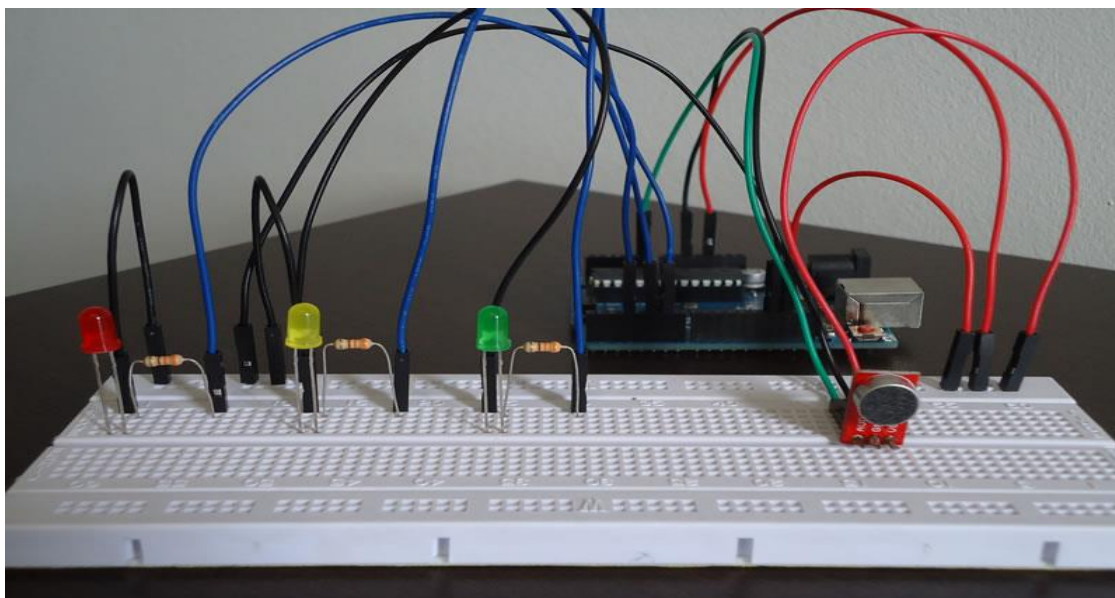
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Diagram 3. Speech Recognition with Arduino-voice control

- Speech to Text Library for Java/Processing. It acts as a solution for all operating systems at once, since the application is written in the Google Speak API language. Among its features, it is worth noting the tracking of a person's voice in real time, specifying the volume threshold, connecting external microphones, and installing a speech recognition language (the full list of features is written on the app's website). The disadvantage of the utility is the inability to process more than 50 requests in 24 hours (as the manufacturer claims, although practical tests have shown processing 500 requests per day).

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