

The fourth lab assignment

The subject of assignment 4 is the implementation (with the Raspberry Pi, the extension board and maybe an additional I/O module) of a device equipped with two forms of the user interface.

1. simple buttons and LEDs should be used to control basic functions,
2. web interface (or other network interface) should be used to control advanced functions.

To implement the device, you can use the modules included in the [set of sensors and modules](#) available in the laboratory (due to the limited number of sets, the use of a specific module should be agreed with the teacher). Alternatively, you can also attach your own USB device to the board (e.g. webcam, sound card, etc.). The functionality of the proposed device can be planned independently and agreed with the teacher.

Below are just a few suggestions intended to be an inspiration:

- A) A system that uses a [motion sensor](#). After detecting a moving person, it should ask (via a voice message) for a password (to be introduced via switches). If the password is not entered and the movement is still detected, it should trigger an alarm (sending information about it over the network).
- B) A similar system but using USB camera image analysis to detect motion.
- C) Build an Internet phone, using RPi with the USB sound card. The local buttons and LEDs should be used to select the contact to call, to initialize and hang-up the call. The web interface should be used to configure the list of contacts
- D) Using the standard audio output of the RPi, please build the Internet radio. The local buttons and LEDs should be used to switch on/off the radio, to select the station and to control volume.
The web interface should provide the same functionalities, and enable configuring the list of the stations.
- E) Using the standard audio output of the RPi, please build the music player. The local buttons and LEDs should be used to switch on/off the player, to select the song and to control volume. The web interface should be used to configure the list songs, to download and to remove the song.
The songs should be stored in a dedicated directory on the SD card.