Installation and operating manual of AR4vision system (version 1.0.0)

Technical requirements:

Desktop Application:
- Windows 10 operating system
- Webcam and microphone

Hololens application:
- Windows 10 operating system in the RS4 version
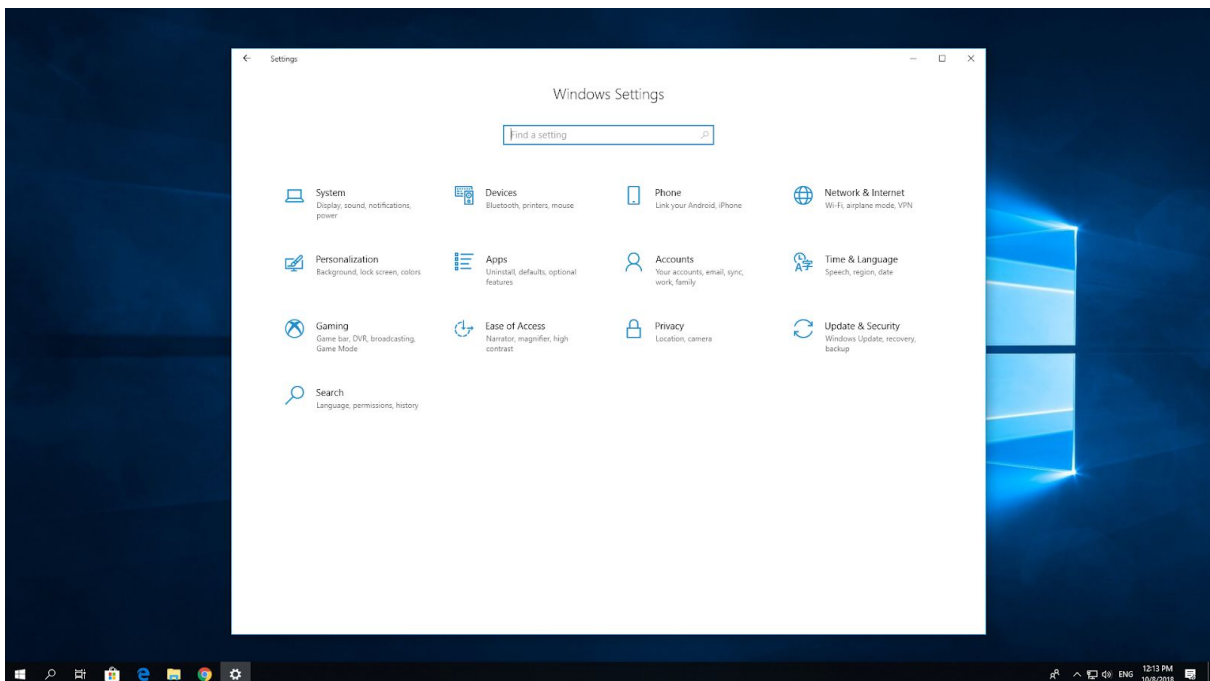- Stable internet connection with a capacity of ~ 5 Mb / s (upload)

Installation:

Before installing the application on a personal computer, it is necessary to make changes in the system settings by turning on developer tools.
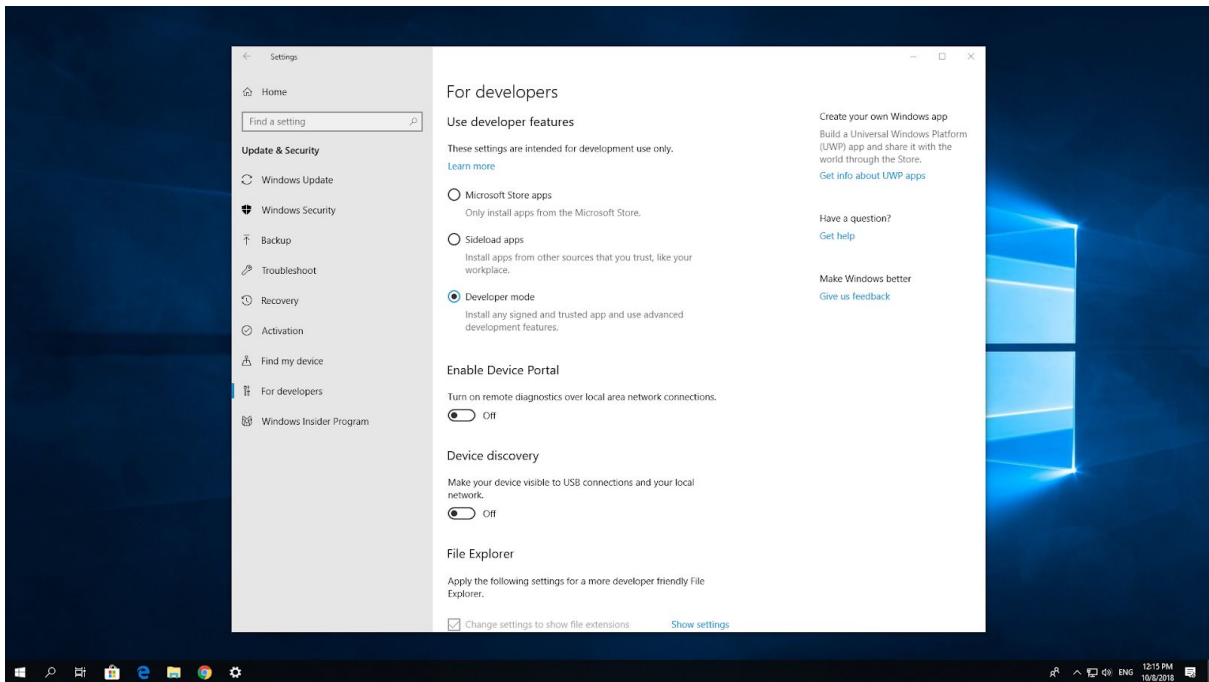To do this, click the **Start** button on the taskbar and select in menu option **Settings**:
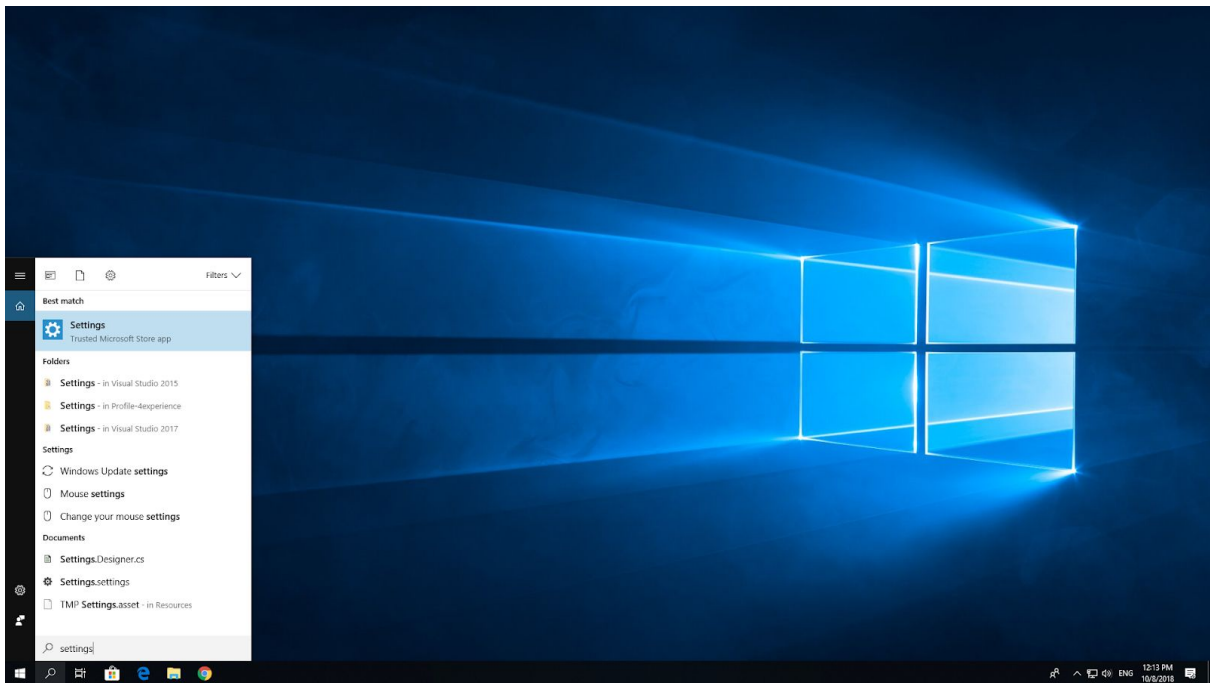
In the Settings window, select the **Update and Security option**:

Then go to the tab **For Developers** in the menu on the left side and select the **Developer mode** option:


After changing the settings, you can proceed with the installation. In the provided folder there should be a file named **Add-AppDevPackage**. Click on this file with the right mouse-button and then select from the context menu **Run with PowerShell** with the left mouse-button:
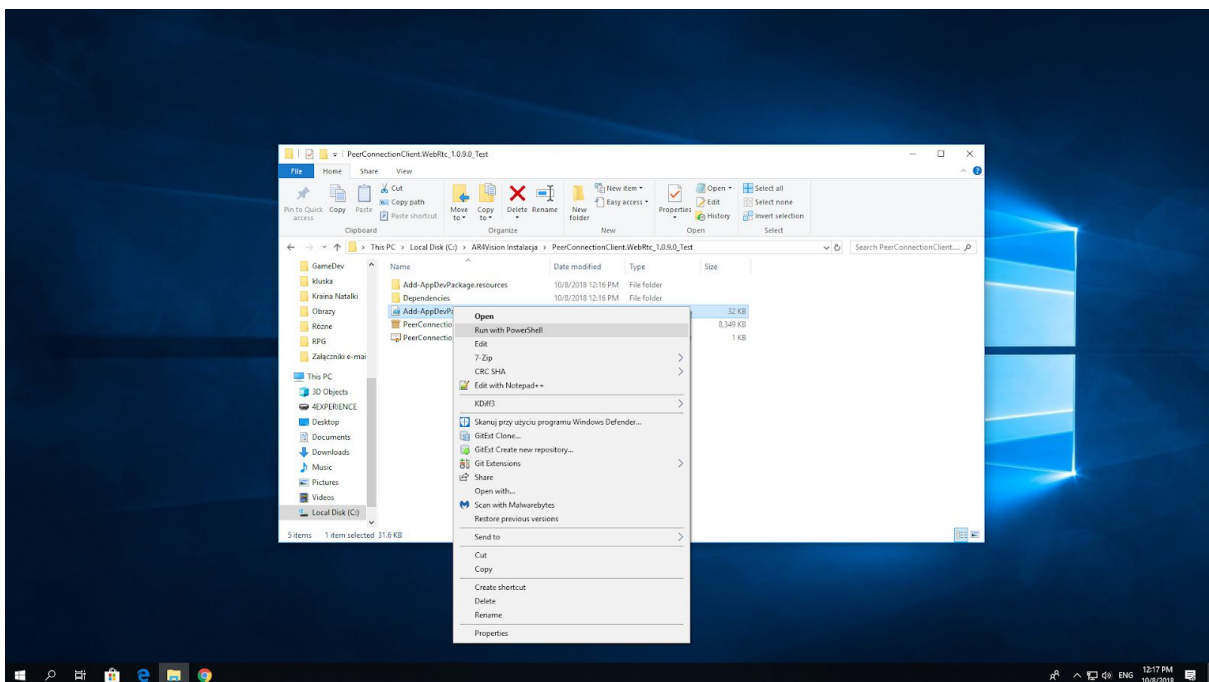
A new console window should appear on the screen:
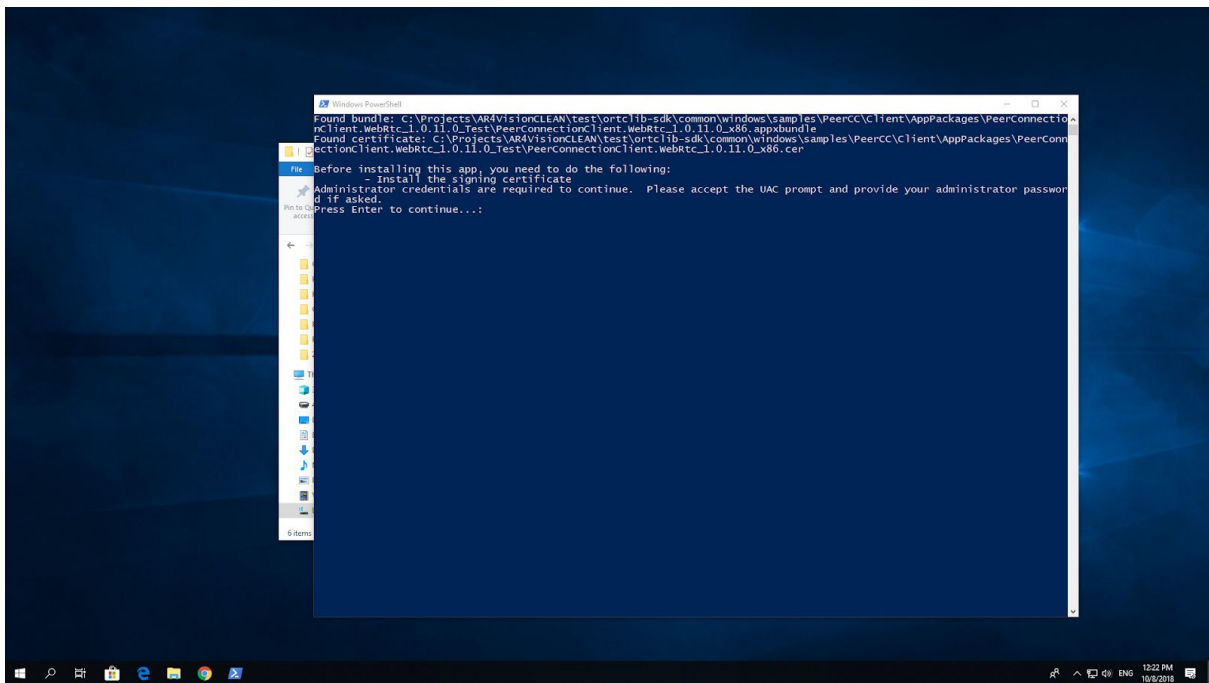
After clicking **Enter**, confirm the willingness to install the certificate by entering the letter **Y** in the console and click **Enter** again:
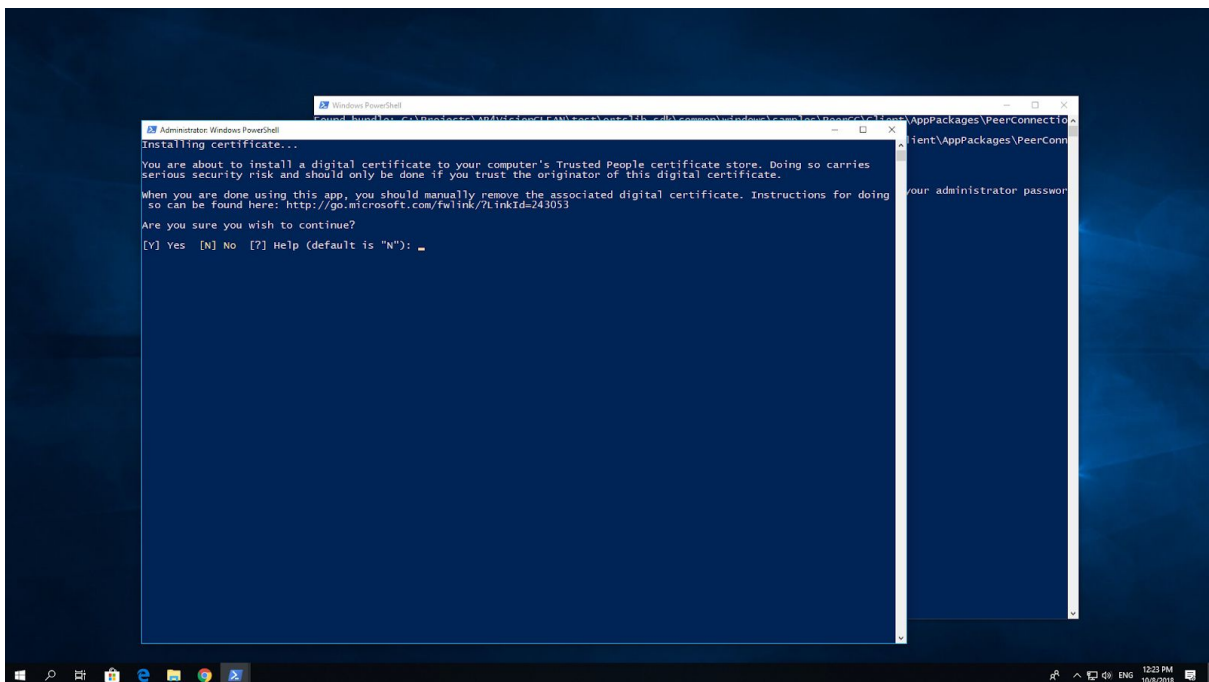
Application manual:

In order to establish a remote connection, both the personal computer and the Hololens device must use the signaling server's help.

To configure the server address in the desktop application, click **service** icon (cogwheel symbol) in the left panel and enter the address **rtc1732.cloudapp.net** in **IP** field in the section **Connection**:
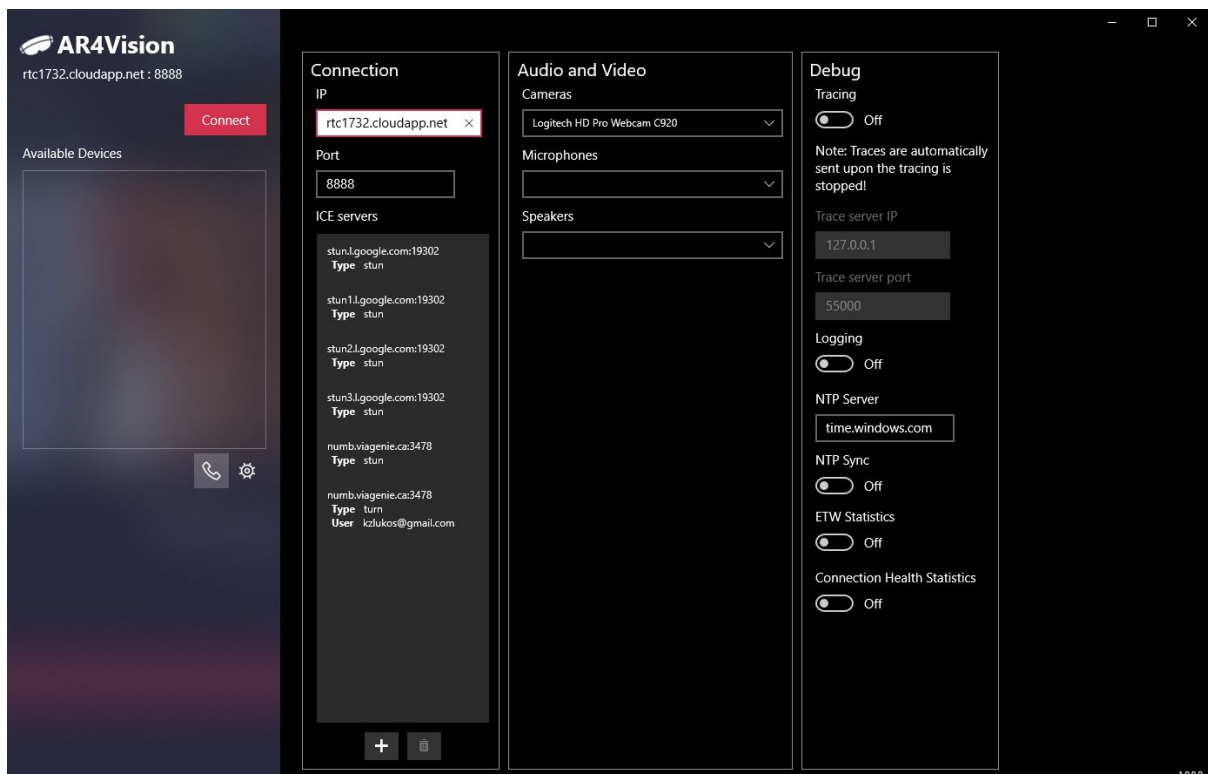

Other settings can be left unchanged - unless there is a need to select other than default media device (camera / microphone).

If the server address has been set correctly, then after clicking the **Connect** button a connection should be made (in case of failure, an error message will be displayed).

In the case of the Hololens application, the connection procedure looks similar - after running the application enter the same server address in the text field and click the button **Connect**.

After connecting both devices to the server, the name of Hololens glasses should be displayed in the desktop application (in the list on the left). The name of Hololens glasses can be changed in the device control panel. To call, just select the appropriate item from the list and click the headset icon below
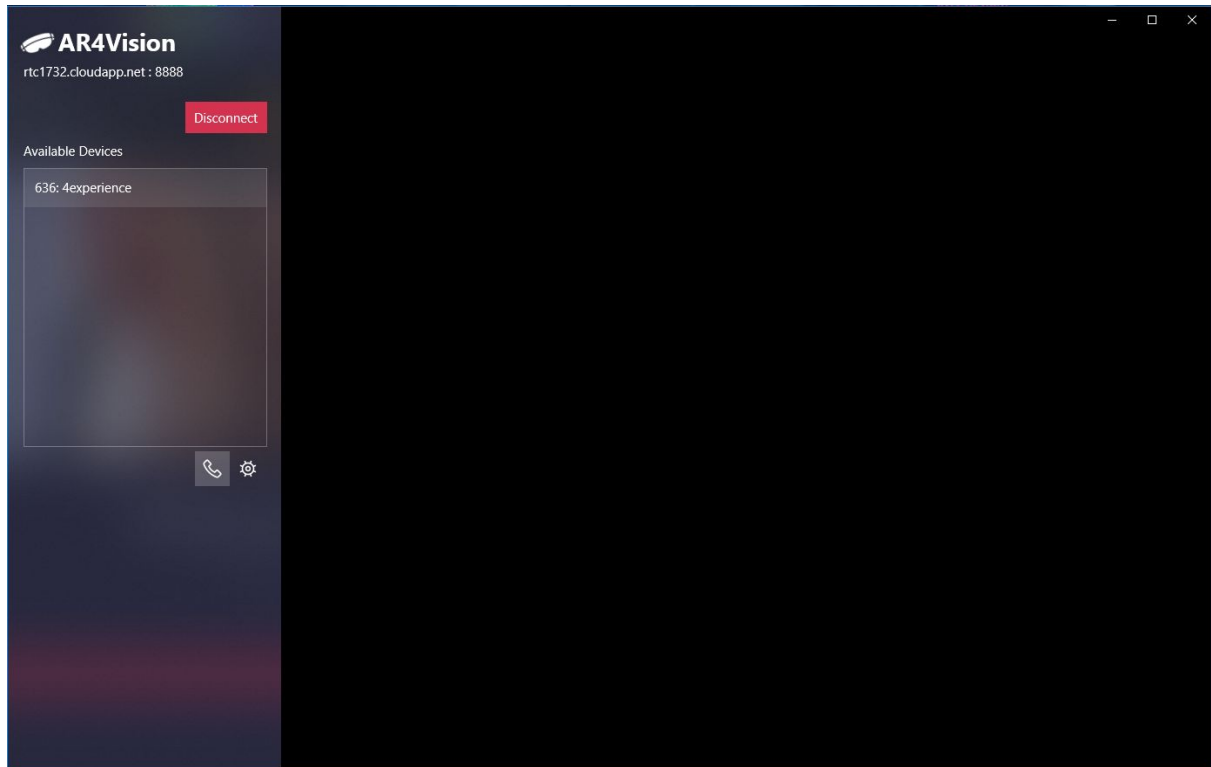
After a short time (usually after a few seconds) on the screen should be displayed the image sent from the glasses
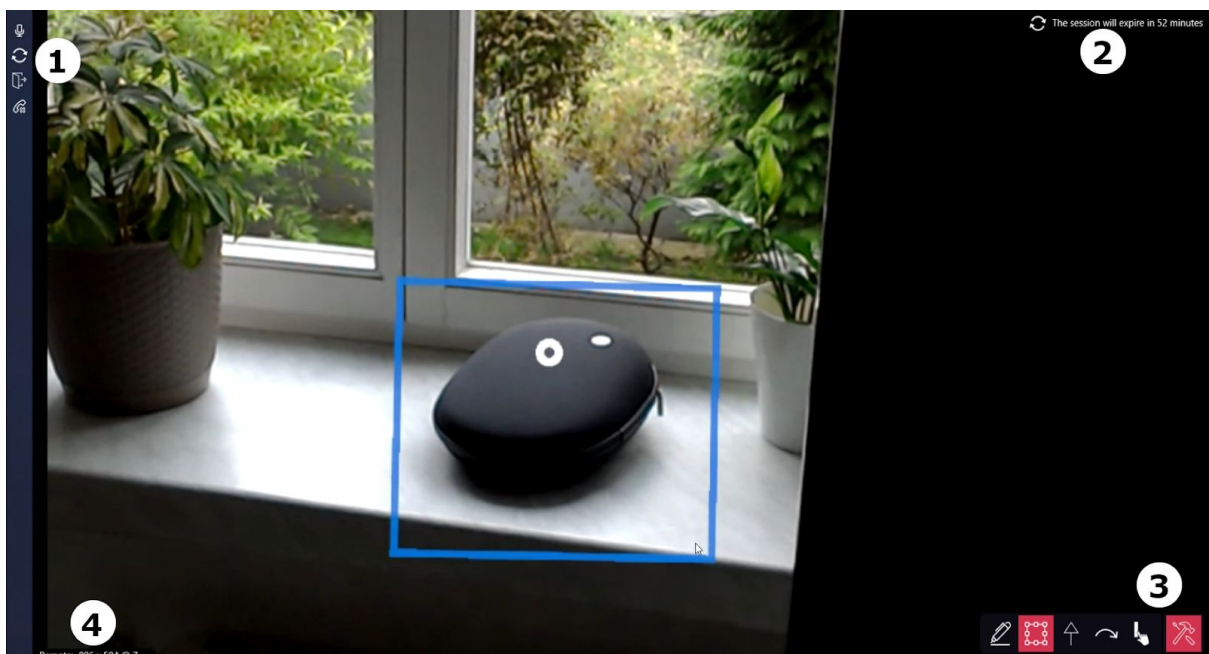
Below you can find a description of the particular elements of the user interface:
1. Sidebar menu
- "Mute microphone" button
- "Refresh HoloLens session" button
- "Logout HoloLens user" button
- "End connection" button
2. Desktop session expiration time and refresh button
3. Toolbox with tools for drawing (in order: brush, marking, straight arrows, free form arrows and line thickness)
4. The resolution of the displayed video streaming and the number of frames per second

Keyboard shortcuts:
- Holding down the **Ctrl** key allows to display the arrow signaling the direction in which the user of the glasses should turn his eyes
- Holding down the **Space** key allows you to freeze the image (makes drawing easier)
- Using the numbers **1**, **2** and **3**, you can quickly select a tool
- Pressing the **Backspace** key will delete the last object drawn
- Pressing the **Delete** key will delete all previously drawn objects

Comments:
- The arrow indicating direction to the user is displayed on the Hololens device almost immediately, but in the desktop application it appears with a certain delay. Due to the occurrence of this delay, it is recommended to slowly turn the head in the direction indicated.
- With the rapid rotation of the user's head, there may be shifts in the position of the objects being drawn. It is recommended to start drawing when the head does not make sudden movements.
- Remember to terminate the conversation before exiting the application and disconnect from the server by clicking the button **Disconnect**
- The conversation can be terminated by the Hololens user using the "Disconnect" voice command
- After closing the Hololens application with **Bloom** gesture or **x** button, remember to close the system application window (otherwise there may occur problems with re-connection).