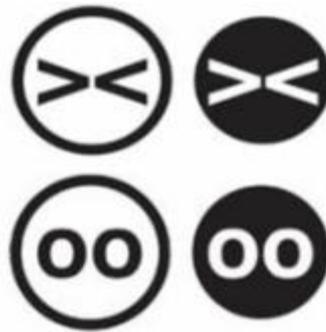


GUIDE

AUGMENTED REALITY GAME IDENTIFEYE



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Prerequisites

- Computer with a webcam
- (preferably a PC since the installation of Silverlight on a MAC can be more troublesome)
- Browser with MS Silverlight 5 plug-in
- 2+ GHz CPU
- 1+ GB RAM
- Internet connection
- Digiboard (or beamer with projection screen)

Silverlight

The IDentifEYE game has been developed as a MS Silverlight application. In order to be able to play the game, the user must have a browser, preferably with the latest, MS Silverlight plug-in installed. The installed version of the plug-in must at least support MS Silverlight version 5.

If you have a previous version of MS Silverlight installed, please de-install it completely before installing the latest version.

MS Silverlight plug-ins are available for both Windows and OSX, as well as for a multitude of browsers. IDentifEYE does not require a specific platform or a specific browser. Given the fact that Silverlight is a Microsoft product though, best results will likely be obtained on a Windows machine, using Internet Explorer. Only the Internet Explorer version of the Silverlight plug-in has the necessary hardware acceleration for graphics operations.

IDentifEYE has been tested on both Windows and OSX, using Internet Explorer, Chrome and Safari (OSX only).

Silverlight can be downloaded free from: <http://www.microsoft.com/getsilverlight/Get-Started/Install/Default.aspx> Installation instructions are provided on the same page. After installation, the user should be able to start the IDentifEYE game right away by visiting the url.

Mac Users should completed delete all earlier versions of Silverlight before installing V4 or V5.

Webcam

In terms of hardware, IDentifEYE does not impose any restrictions, other than the requirement of a webcam. These days, most webcams are close to HD resolution. For performance reasons though, IDentifEYE works with 320x240 screen captures. As long as the webcam supports that lower limit, it will suffice for playing the game.

CPU

The CPU is the abbreviation for *central processing unit*. Sometimes referred to simply as the *central processor*, but more commonly called *processor*, the CPU is the brains of the computer where most calculations take place. In terms of computing power, the CPU is the most important element of a computer system.

In theory, wherever the Silverlight plug-in runs, IDentifEYE will run. However, as IDentifEYE's core functionalities are all centered around the face detection, face tracking, augmentation and marker detection -- which are all computationally (very) demanding operations -- it is recommended to have a powerful CPU. What a powerful CPU is depends on the used platform and what other processes are running on the machine at the same time, so it can't be specified.

Great results have been obtained with Intel 2 GHz and up CPU's. The effect of lesser CPU's will be that the machine's CPU usage will peek while playing the game, and the cooler fan will probably spin up. During tests, only when using an Intel Atom powered netbook, noticeable glitches in the game operations were detected.

RAM

RAM is the acronym for *random access memory*, a type of computer memory that can be accessed randomly; that is, any byte of memory can be accessed without touching the preceding bytes. RAM is the most common type of memory found in computers and other electronic devices.

In terms of RAM, the IDentifEYE game can be pretty demanding. Due to the graphical nature of the game, many images will be held in the memory at any one time while playing. Based on tests, a lower limit of 1 GB of RAM was determined. Keep in mind, that other processes running on the same machine as the browser will also consume RAM and might lead to a higher overall RAM usage.

Not having enough RAM available while playing the game will result in hard disk swapping -- orchestrated by the operating system -- and ultimately creating unwanted visual side-effects (glitches).

Getting best results

Face detection

Face tracking in IDentifEYE is based on skin colour detection. In order to get best results, try to:

- Face the camera whilst playing the game;
- Sit straight in front of the camera, centering the face in the view pane;
- Sit at about 80 centimeters away from the camera;
- Avoid multiple faces and/or other body parts (like hands) in the camera view;
- Arrange for clear ambient light, that:
 - does not cast a lot of shadows onto the face;
 - does not cause bright highlights in the face, eyes or glasses;
- Sit in front of a background of a non-skin color. Blue and green backgrounds work best;

When you play the game and augmentations become jumpy or fails completely, one of the following things is the matter:

- There is insufficient light;
- There are other objects in the camera's view that are assumed to be (potential) faces;

When you play the game and augmentations are projected all over the game's screen you are probably sitting too close to the webcam.

Please make sure that when you show the marker to the webcam the whole marker is visible on the screen. Please show the marker only until you see an indication that the marker has been recognized. Showing the marker longer might cause the game to interpret the marker as the answer to the next question.

Twinking face detection

In order to adjust the game to your environment, please visit <http://identifeye.ezdev.eu/?debug>.

Run the game up to the point that your camera is activated. In the frame where you see yourself you'll find sliders at the bottom. These are your controls to play with.

Now you can tweak what shades of color should be interpreted as skin tones. This is based on YCbCr color space (<http://en.wikipedia.org/wiki/YCbCr>) – as is the default for these kinds of applications.

On the screen you will see yellow sections – those are the detected skin tones. In red you'll see what the game considers to be your head. Now you can change the values of the thresholds in such a way that only your head will be found and the section is not too jumpy. You will notice that the red section will have a delay versus the yellow section. This is a conscious decision. It makes the augmentation less jumpy.

Make sure you use the debug functionality on the face of the person who is to play the game!

Once you have found the ideal setting for your environment, click "SAVE". From that moment on the game settings will be stored on that particular computer, also outside of the debug-page. If you want to return to the default settings, just click DEFAULT and then SAVE.

Marker detection

To some extent the 4 markers (ABCD) are not a very sensitive process and therefore should not cause marker detection errors. For best results however, avoid:

- Displaying multiple markers at the same time;
- Holding markers in a way that fingers overlap the marker (the black border is part of the actual marker).

When things go wrong

Important

Silverlight applications run in a sandbox¹. This means that a Silverlight application cannot crash the browser, nor can it freely access resources on the user's computer. If a problem occurs related to the stability of the browser, or to any other program or file on the user's computer, IDentifEYE cannot be the cause!

Trouble shooting

Whenever a user has problems starting or playing the game, please do the following:

- Make sure the Silverlight plug-in is installed by visiting any other MS Silverlight based website, or directly by going to the previously mentioned download URL;
- Make sure the user is not behind a firewall that blocks Silverlight applications (.XAP); XAP (pronounced ZAP) is the file extension for a Silverlight-based application package (.xap). This file contains the compressed assemblies and resources of a Silverlight 2 application.
- Determine whether the currently signed in user has enough privileges to:
 - Download Silverlight games;
 - Execute Silverlight games;
 - Use the webcam;

¹ See: [http://en.wikipedia.org/wiki/Sandbox_\(computer_security\)](http://en.wikipedia.org/wiki/Sandbox_(computer_security))

Silverlight will show a popup every time that an application wants to access the webcam. On that popup a user can choose to accept his choice. You should either not see the game URL on this tab, or see it with the above Allowed permissions.

In case you read Deny there, please remove the permission and restart the browser. Next time, the same popup will be shown to ask for permission to access the webcam.

If you see yourself in this format (page image can differ with platform) you know the webcam is working properly and the user has access permissions to use it.

The actual window lay-out of the Silverlight Preferences window and tabs may differ per operating system and plugin version.

Still having problems

Sometimes, when the above doesn't solve the experienced problems or lead you to a root cause, the following might help:

- Uninstall Silverlight, then reinstall it;
- Clear the browsers cache;
- Add the game URL to the trusted sites of the browser;

Last resort

When all above fails, please make a written note of the items below to assist the game developers to help you or rectify possible programme errors.

- Computer (Make / CPU / RAM / Webcam);
- Operating System (including version);
- Browser (including version);
- Firewall (yes/no);
- Wifi or wired network;
- Is the user administrator on his/her computer (yes/no);
- A clear description of the problem;
- Screenshots of the problem screen (if applicable);
- Screenshot of the Silverlight Preferences tabs (context menu, right click on the game);

Please Note

No data whatsoever are transferred to a server outside of the local machine on which the game is played. No data are requested by an external server, neither are data offered to an external server.

The personal data that are optionally entered at the beginning of the game are temporarily stored in the machine's RAM during the game session. Those temporarily stored local data are cleared after the session by means of the 'explicit content clear' functionality that is part of the game software.

It can thus be guaranteed that no data that are entered in the IDentifEYE game are stored for whatever purposes, either externally or locally.