WINDOW THROUGH THE WALL

An Electronic Window on a Real World

What is it? 2

How does it work? 2

How does it appear? 2

What can users do? 3

Software 4

Software needs 4

Requirements 4

Software for encripted connection 4

Hardware 5

Box and design 9

Some experiments and trials 10

What is it?

The e-window is part of a multi-level connectivity system between shared working environments: the Multifactory Network.

How does it work?

It’s a public videochat system to connect different spaces based on Raspberry PI.

It has to look as similar as possible to a “real” window: it has basic user interface and It doesn’t have mouse, keyboard, or other functions. It’s just a “window”.

How does it appear?

A window frame with a flat monitor instead of the glass. Speakers are part of the frame on sides. On top there is a webcam with microphone. On the bottom there are three buttons with these labels:

ON/OFF

SELECT

CONNECT/UNCONNECT

What can users do?

1 – you switch on the window. All you need to do is to press the “ON/OFF” button. The window switches on, makes an auto boot and shows a list of all the windows available.

As a window switches on, it automatically becomes visible to other spaces.

(can also show which are “closed”, “open and free for connection”, “open and busy, already connected”)

2 – you choose from the list which window you want to connect to with the “SELECT” button. You can choose both “free” and “busy” connections.

If you choose a “free” connection

3A – you push the “CONNECT/UNCONNECT” button. This starts the connection with the selected window with no need of a manual answer from the other window

If you choose a “busy” connection

3B – you push the “CONNECT/UNCONNECT” button. This sends a connection request to the selected window. To start the connection, a manual answer from the other window is required.

4 – when you are making a connection with a window and you want to change window, you push the “CONNECT/UNCONNECT” button. This brings you again to the list of available windows. So, you’re back to the point 2

5 – when you are disconnected without an explicit decision (if the line falls, or so on), the window tries to make a new connection to the previous window for three times. If this fails the window becomes available and comes back to the list with the “free” label.

6 – if a window is already connected and another one tries to connect, it receives a message with the request. If you push the “CONNECT/UNCONNECT” button, the window quits the existing connection and starts a new one

Software

We need help to develop an easy user interface without keyboard and the use of the buttons. The user interface program sees the status of the network and calls the interconnection program when needed.

The OS is Raspbian (OS based on Debian optimized for Raspberry PI)

Software needs

1 the management of the window

2 the management of the network of all the windows

3 the connection and videochat by itself

Requirements

Stable video and audio connection

Small band usage (or automatic band width adaption)

Encrypted connection

Software for encripted connection

Examples of Free Software for encrypted video chat (Maybe an optimization of the interconnection program for Raspberry PI)

Tox: there are some clients with video-chat capabilities (only two), may be a little bit programming work, there is no raspbian binary https://tox.im/

Ekiga: ekiga is available for raspbian and a lot of people run this software on a raspi. To check if this software can control the client via shell-scripting. This is essential for autostart the software and establish a connection with buttons.

Linphone: this videochat software can be used with a shell script.

Hardware

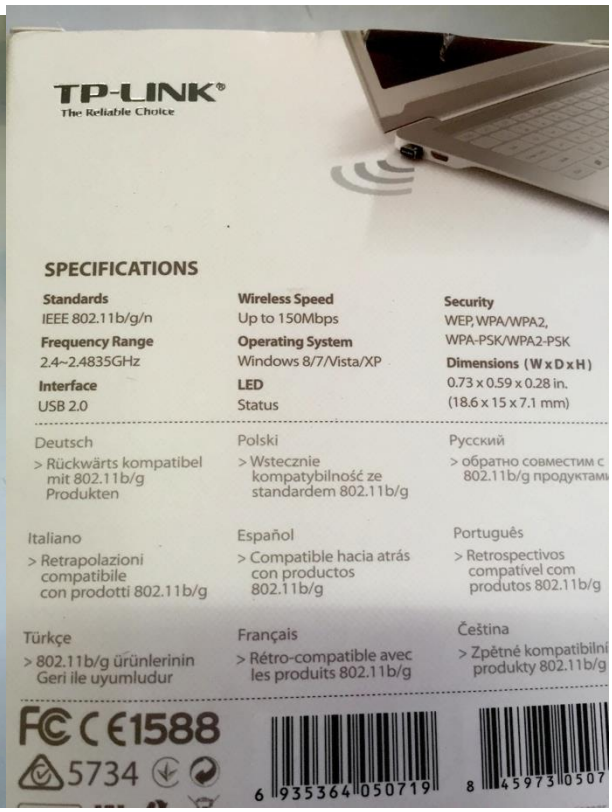
Here a check list of materials needed to build one window:

1X raspberry pi2

1X power adaptor for raspberry PI (2A is ok)

1X webcam (it has to operate with raspberry pi - check the model) – TIP: the model in picture (Genius WideCam F100) is a 120-degree ultra wide angle Full HD Conference Webcam, is tested, has good performances both for audio and video and works with Raspberry PI2. It can be easily found in major stores as Conrad (more or less 40€).

1X wlan dongle (it has to operate with raspberry pi - check the model) – TIP: the model in picture (TP-LINK Nano USB Adapter 150 Mbps mod. TL-WN725N) is tested and works with Raspberry PI2. It can be easily found in major stores as Conrad (more or less 10€).



1X tft screen with HDMI input because raspberry pi has HDMI output (OR with DVI input)

1X HDMI cable (if the tft-screen has dvi input, use HDMI-DVI cable)

1X pair of speakers WITH amplifier and analog volume control (if the monitor has not HDMI)

1X on-off switch

2X one-way button (select and connect/unconnect)

1X SD card (minimum 4GB)

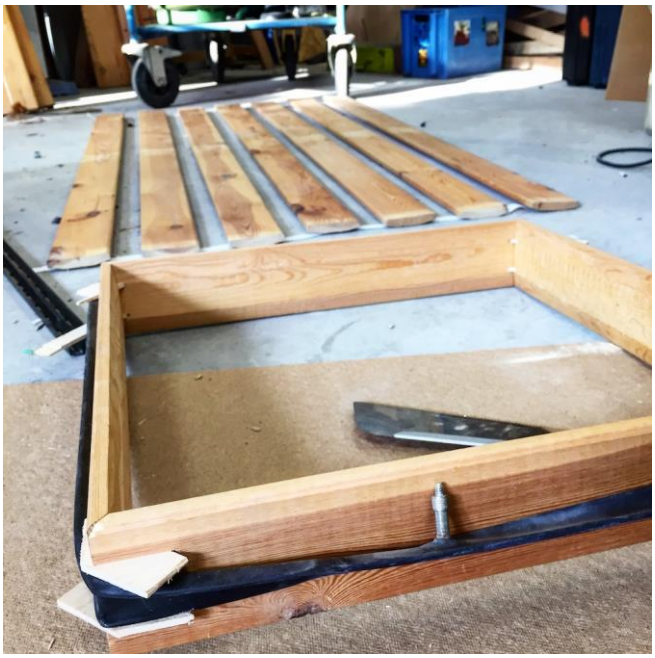
1X usb keyboard + mouse (to upload the OS and program)

Box and design

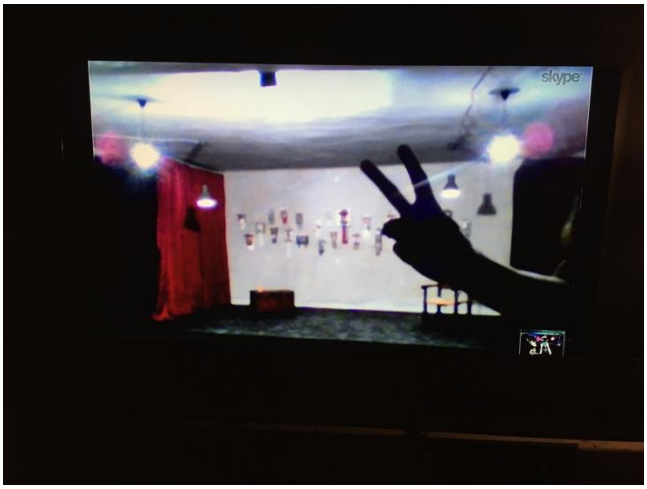
Metal, wood, wheels (to move the window if needed)

The box should be similar to a real window. The window should fit the tft screen, as Raspberry PI is very small.

We are making 2 prototypes with Steppy from Machbar freiland



Some experiments and trials



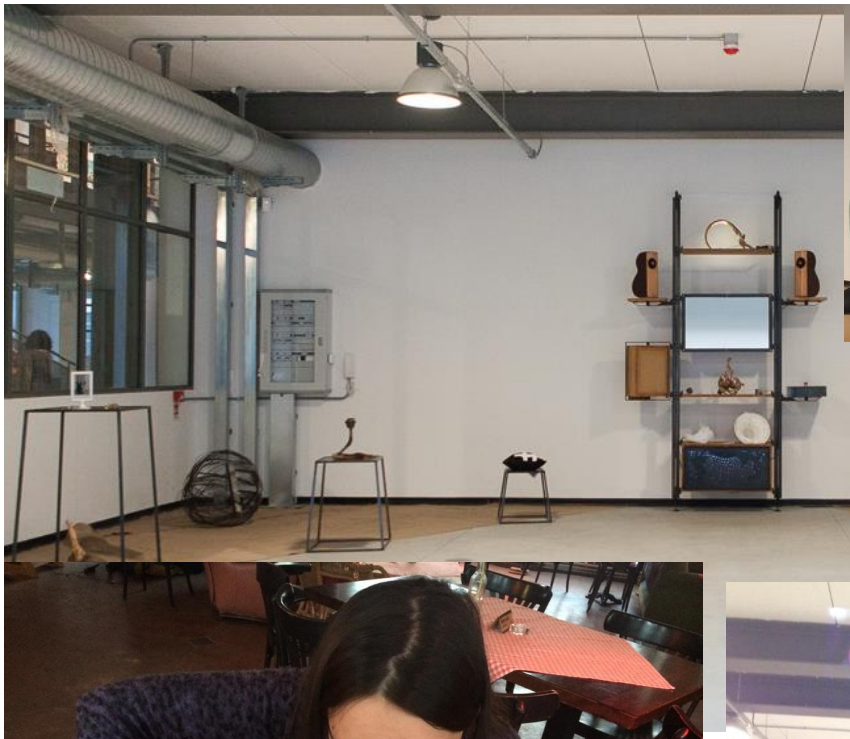
MONOKULTUR, Silent disco (3 channels) party. Open window from/to: freiland-Potsdam/The Garage-Greece. Duration: one night on August 29, 2015

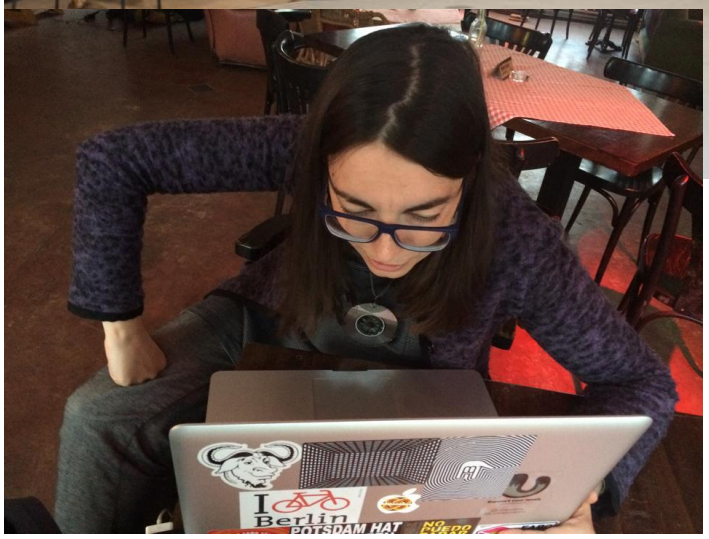
SCRAP BECOME STAFF, upcycling contest, Prize giving.

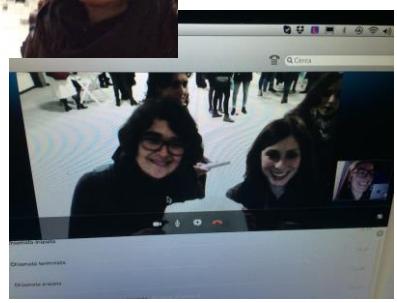
Duration: 2 hour, on July 4, 2015

Open window from/to: freiland-Potsdam/Venice.

Partner : www.lamentecomune.it



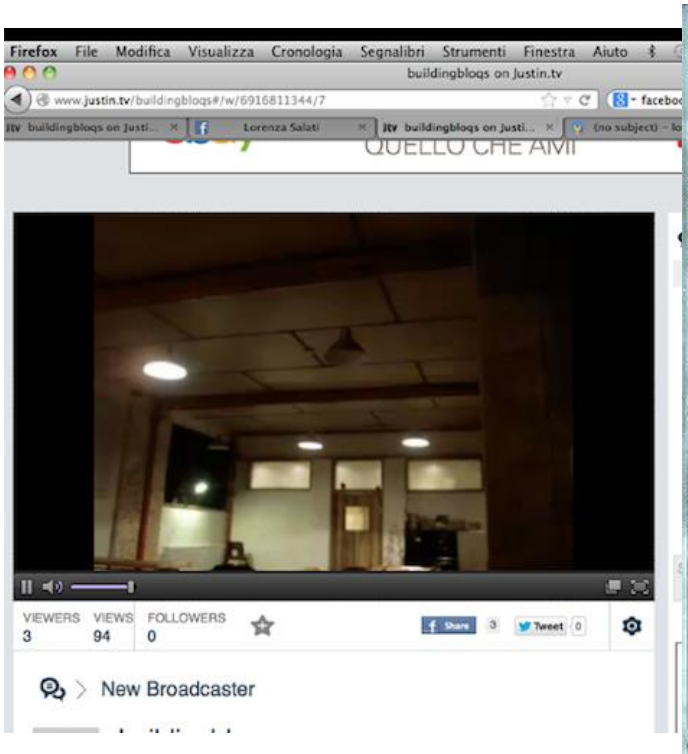


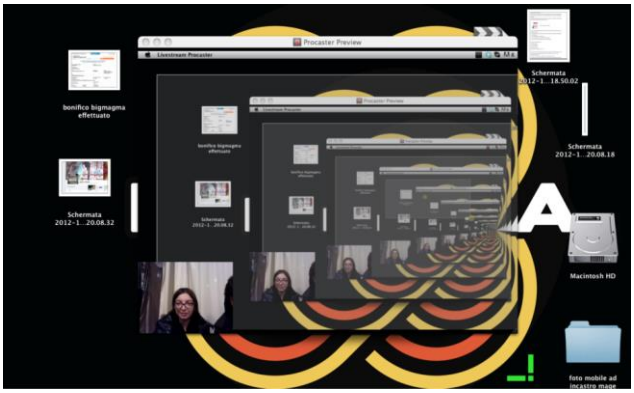


Milano Citta' Mondo – art exhibition

Duration: 2 weeks, 11.00-19.00, from March 25 to April 6 2015

Open window from/to: Potsdam/Dresden/Milano.





MEET IN MAGE and others events at MAGE

Duration: 10 different events between 2013 and 2014

Open window from/to: Milano/another place