Lärchenstraße 1
4616 Weißkirchen
Tel. +43(664)1106886
Fax.+43(1)2533033/2764
http://www.seewald.at
mailto:alex@seewald.at

We developed the flexible Augmented Reality application **Magic Mirror** based on Microsoft Kinect in 2012. It is now in its third release.

Just like a real magic mirror it allows you to replace the background scenery and take on a different face. In the past, we used faces of Austrian and international politicians, but also default virtual avatars from the online game World of Warcraft, or specially created faces as in the Easter special 2014. Faces and backgrounds can be changed via the same hand gestures as in our Universal Remote application. Another gesture triggers a screenshot that can be put online immediately.

The system has been developed since 2012 and has been presented at various locations in Vienna, Austria.

- at the Pioneers Festival 2012 in Vienna (sponsored by Microsoft Austria) - we also held a talk on its technology.
- at the Future and Reality of Gaming conferences in the Vienna City Hall in 2012, 2013 and 2014.
- at the Subtron shop in Museumsquartier Wien in April 2014 as Easter special event. This was the first public installation and it was available for 21.2 days.

One of the uses of such a system is, obviously, entertainment. However, during installation the system also tracks people regardless of their interaction with the system and here we present what can be obtained by analyzing this data.

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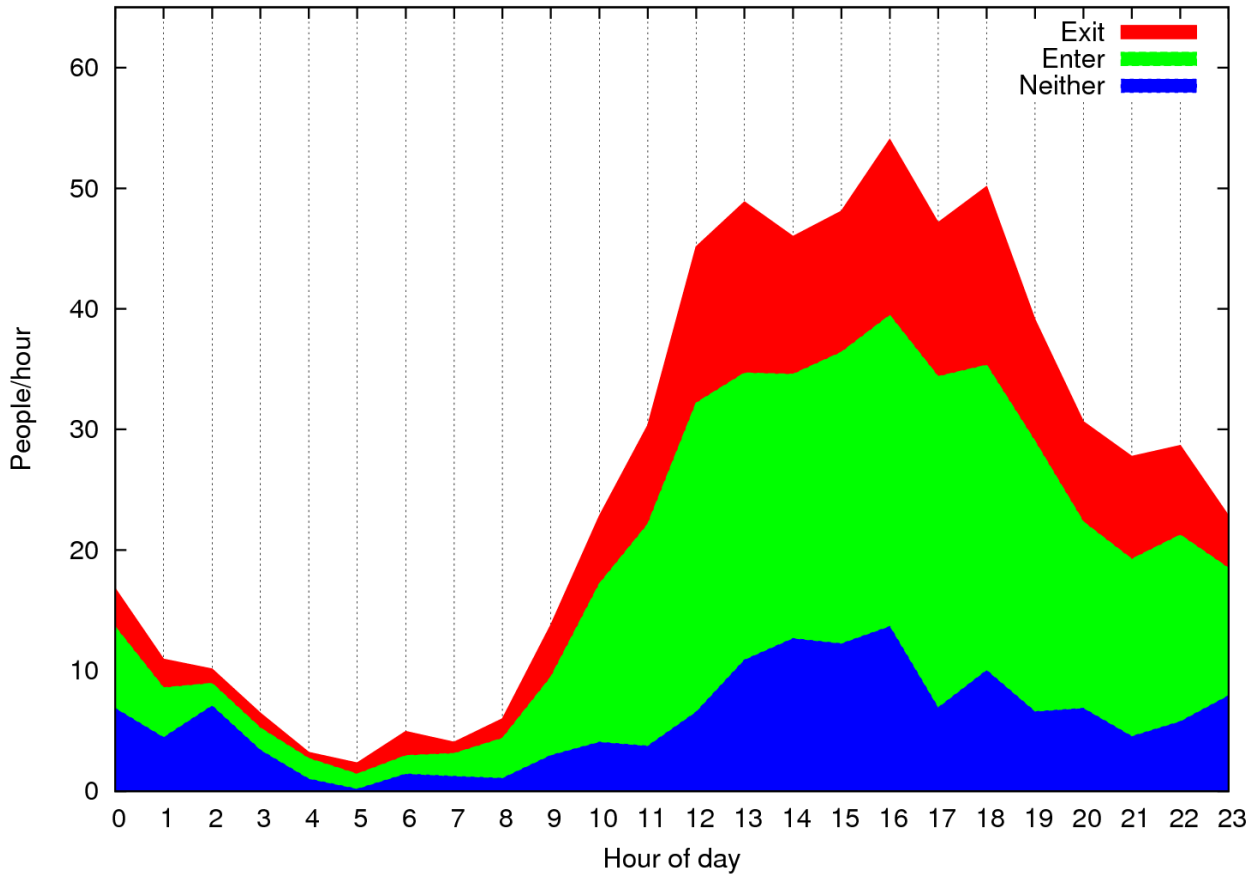
SEEWALD SOLUTIONS

People Counter



The system will count people passing from left to right (*Enter*) and from right to left (*Exit*) separately. People who enter and exit on the same side are counted as *Neither*.

Each column shows the number of people per hour who entered or exited within the given hour of the day. The bands show additive values, e.g. for hour 15, there are 24.2 people entering, 11.7 people exiting, and 12.2 people neither entering nor existing, yielding a total of 48.1 people counted per hour.

Values were computed over the whole 21.2 days of the Easter 2014 installation, and show a distinct daily pattern. A total of 13,212 people were counted during this period.

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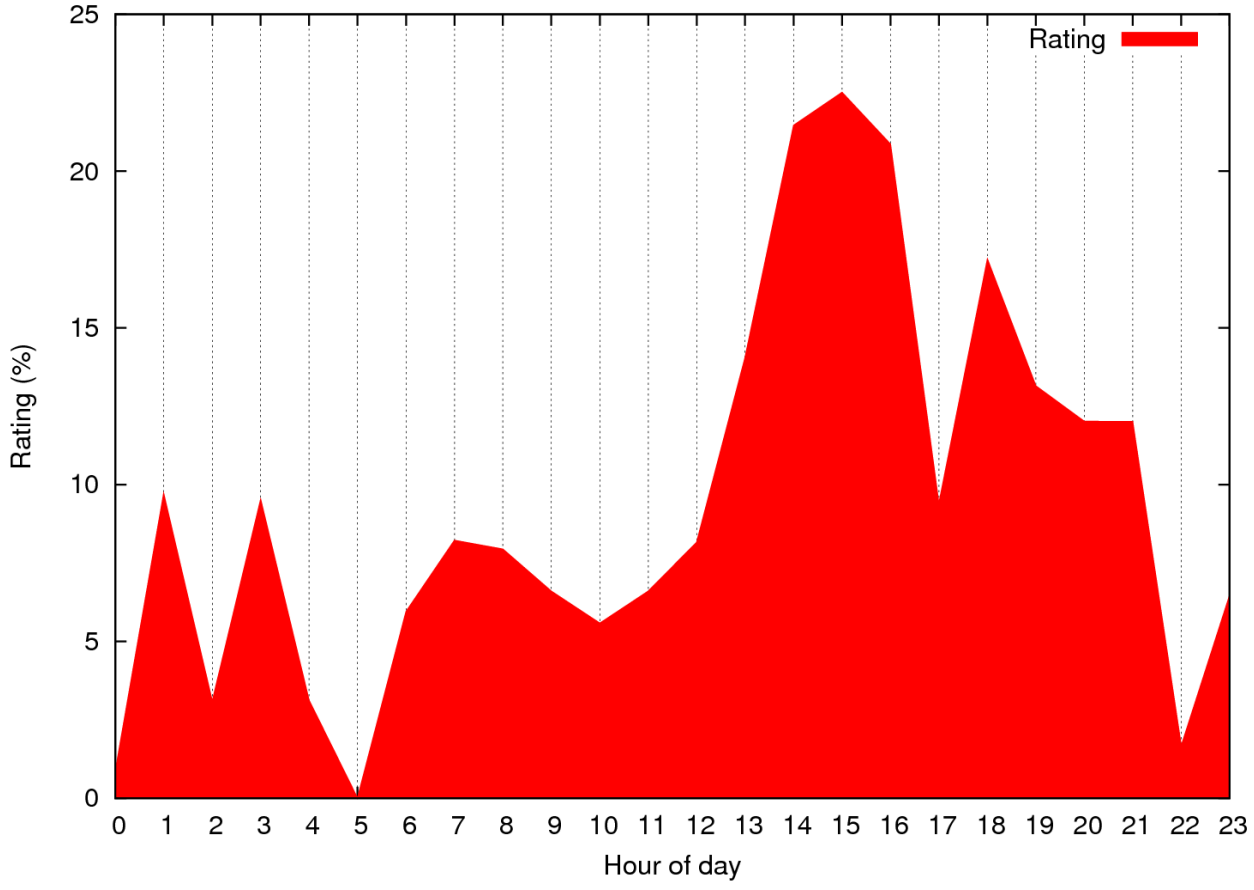
Shopping Window „Rating“

The system will also count people actually watching the screen, using the integrated face tracker that is used to modify the faces.

Of all 13,212 people counted, 1,677 looked at the screen - on average for 15.5 seconds - which gives an overall rating of 12.69%. The system was watched for a total of 12,305 seconds (3.42 hours)

463 people (3.50%) watched for at least 15s, 205 people (1.55%) for at least 30 seconds, and 69 people (0.52%) for at least 60 seconds.

Depending on the hour of day - i.e. at peak hours - higher ratings could be obtained, e.g. for hour 15 the rating was 22.51%. Rating estimates per hour are not smooth, partially due to small sampling size for some hours but also since people counts are not smooth.



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Head Pose Heatmap

It is possible to utilize the integrated face tracker to output rough estimates for head pose and therefore gaze direction, which can be used to build heatmaps that can - with proper calibration - be overlaid on an image of the actual shopping window. This shows *where* people generally look at when looking into the shopping window and enhances the shopping window rating with very specific information that is extremely hard to obtain using any other means.