What You see here

The poster shows a Single Image Random Dot Stereogram (SIRDS) that was constructed from a depth map of a 3D scene.

In Single Image Stereograms (SIS) a periodic pattern is distorted according to the depth information of a 3D scene stored in the depth map.

Each eye sends a picture of its view to the brain for people whose eyes are about equally used by their brain (others may have a look behind this page). Due to the eye displacement, the two pictures differ slightly because the view point is different. By combining these two pictures the brain then reconstructs from learned experience a 3D impression that commonly is referred to as: "What I see is…".

To "see" the 3D depth information contained in a SIS, the two pictures (one of each eye) have to be combined by the brain slightly different than normal: The two pictures have to be combined (overlaid) by the brain with a displacement equal to the horizontal extent of the repeated pattern. This displacement distance is marked by two small black triangles in the middle of the upper border.

To make the brain combine the two images displaced by this distance and not "corner on corner" as it has learned, one must orient the eyes in a way as if looking behind the SIS. How much behind depends on the individual eye displacement and the viewing distance. With a bit of practice one can learn to just "scan" the viewing depth starting from the actual poster position to find the correct eye orientation. When scanning in front of the SIS instead of behind ("crossing" one's eyes), there is an eye orientations that also reveals the depth information but reversed. For some people this is easier but is more exausting as the eyes are far from their relaxed orientation (in which both viewing directions are nearly parallel).

When scanning the viewing distances behind the SIS one sees the SIS doubled, i.e. in total 4 triangles as each eye sees two. To get the right eye orientation one needs to make the two innermost triangles overlap, i.e. the right eye's left triangle coincide with the left eye's right triangle (when viewing cross-eyed it's the other way round). The periodic pattern will then look "normal" again.

The distortion of the periodic pattern is done in such a way that the brain will adjust the local depth impression according to the depth map used for construction to make the pattern match over the whole image. The SIS is constructed for a viewing distance of about 2m.

This SIRDS was created with the open source programs:

- Blender (whose mascot is Suzanne) (http://www.blender.org) to create the 3D scene and its depth map
- stereograph (http://stereograph.sourceforge.net/index.html) to construct the SIS from a random dot image (used for the periodic pattern) and the depth map