

Experiencing LED: Lighting: New Form and Experiential Qualities Emerging in Lighting Systems using LED

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Introduction

The project investigates what new forms and qualities of light emerge from technologies such as LED, with a particular focus on basic form qualities and parameters. Existing linear functional understandings of the relation between light source, light flow, reflection and visibility is challenged by relational understandings, where the materiality and visibility of the light emerge through mutual influences between several adaptive and transformative elements.

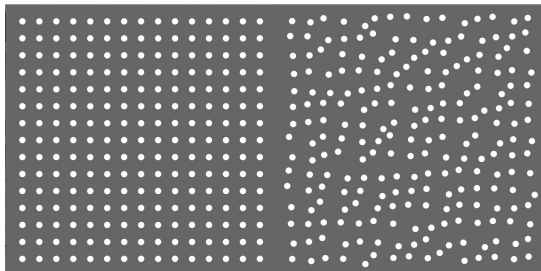


Fig. 1: Linear LED cluster. Screenshot from the pixel visualization software.

Investigations into pixel patterns

The first investigation looks into the qualitative parameters related to the pattern of pixels. Most LED products are produced with grid orders or similar systematic and repetitive patterns. We have developed a software tool that allows us to adjust pixel organization, size and distance, and sense the impact of different organization of pixels on perceptual and form qualities. We investigate the organization of pixels, as patterns of material light and as experience light perception.

The systematically square-grid arranged pixel pattern evokes extensive reaction from the perceptual system. A pulsating interference pattern is evoked and the eyes are highly occupied with this stressful task.

This reaction seems to appear within a rather large range of pixel scales, actually the whole range we were able to display on our 56" LED monitors. That is a range from 20x30 pixel to 4x6 pixel within the screen size. Further experiential tests will investigate to what extent there are limits and border phenomena in higher and lower resolutions. These resolutions are similar to the experience of light armatures in office buildings, which often is structured into rigid grid patterns, and many other large scale light designs, where the distance to the lights of the experienter scale the experience of the pattern into the same resolution as our screen prototype.

When the pixel pattern is organized by perlin noise (Perlin 2002), all perceptual artifacts disappear. In-between these to extreme positions (the rigid grid structure and the random pattern generated by the perlin noise) is a very interesting qualitative parameter, highly relevant in the design of LED based lighting installations, which invite to pixel based designs and distributed light sources.

References

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