

# Light Organizer

Degree programme : BSc in Computer Science | Specialisation : Distributed Systems and IoT  
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The widespread use of RGB lights in recent years has allowed the creation of large and creative electronic visual displays at a low cost. Most displays are arranged in a grid-like disposition, which allows a simple and organized way of displaying information. Unusual dispositions would require the display controller to understand their irregular arrangement. A unified and automated way to organize lights in such dispositions is still lacking.

## Introduction

Setting up a large number of unordered lights as a display is tedious and error-prone. The lights must be placed in an organized manner and the arrangement must be understood by a controller or software that controls the lights. Our system, based on visual sensors (e.g. a smartphone camera) and image processing, automates all those steps.

## Concept

Light Organizer system can organize and coordinate any chaotic or ordered disposition. Using a camera to calibrate the multitude of lights that compose one display from one fixed point of view. The system will generate and remember every disposition to allow any requester to display pictures, bitmaps, or animations. Display controllers stay simple in logic, allowing anyone to create their own implementation adapted to any lighting system. The calibration process is shown below (General use case, Fig. 1).

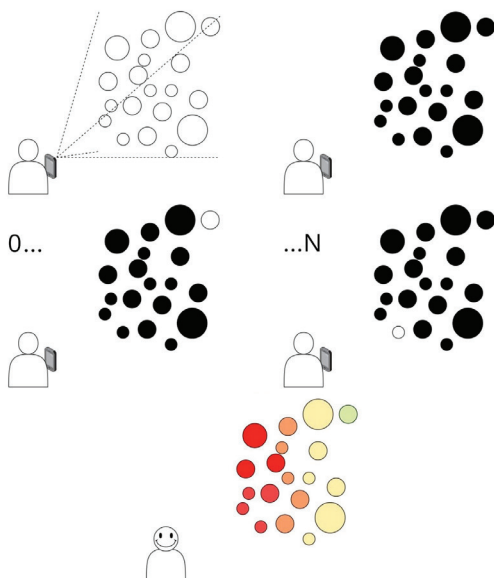


Figure 1 - General Use Case

## Goals

The bachelor thesis is the continuation of a preliminary project, which aimed to prove the concept of an automated organization of a specific type of LED. The goal of this work was the integration of a stable organization process into a simple system from the end-user point of view. Key points that were to be implemented:

- Development of an Android client.
- New lights can be added or removed dynamically.
- Guided setup of light-controllers through the Android client.
- Adapt various light systems to be compatible.
- Any disposition can be represented within the system (e.g. five LED strips and seven lamps).
- Live calibration (i.e. organization of any disposition).
- Depiction of dynamic content on organized disposition.
- Potentially improved calibration methods.

## Results

The complete system consists of all the features mentioned above. We can now affirm that users can setup and calibrate their favorite lighting system in a simple manner and display pictures, bitmaps, or animations (Swiss Cross, Fig. 2).



Figure 2 - Calibrated LED disposition, displaying the Swiss cross.



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