Gökhan
KAYA

| | |
|---|---|
| Student | Gökhan KAYA |
| Examiners | Prof. Dr. Heinz Mathis, Selina Rea Malacarne |
| Subject Area | Wireless Communications |

# Surrli with Bluetooth

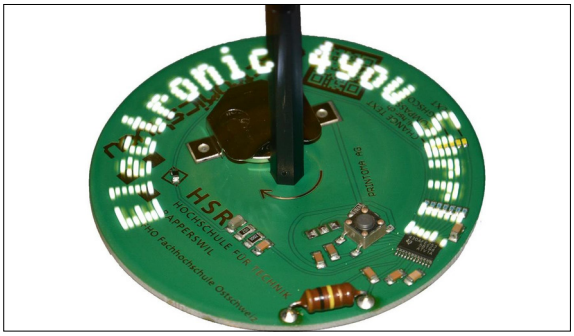

Fig. 1 Spinning Surrli

## Introduction:

The Department of Electrical Engineering at the HSR developed a spinning top called Surrli for marketing and demonstration purposes. Surrli has a row of LEDs mounted on the top to display a predefined text while spinning (Fig. 1). Up until now, the programming of the text has been carried out by capturing light pulses using a phototransistor.

## Objective:

In this term paper, the main goal is not only to switch the LED programming to Bluetooth, but also to write a complete new firmware and control the LEDs with a LED driver. For future Surrli generations the LED drivers can be stacked and software can be easily expanded to use an arbitrary number of RGB-LEDs.
A custom-designed Android application gives the user the possibility to program the Surrli with an individual text or picture (Fig. 3).
Instead of the previously used MSP430 the ublox NINA-B112 module with an integrated nRF52832 chip and antenna is used.

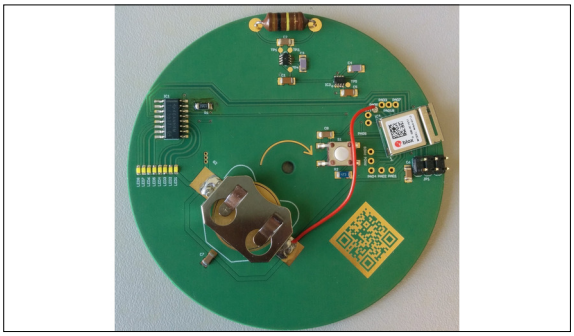

Fig. 2 PCB Prototype

## Result:

The result of this project is a Surrli prototype with one LED driver that can control 8 LEDs (Fig. 2). Several drivers can also be connected serially so that in the future many more LEDs can be implemented. To customize the text message the Android application must be used. This application is currently able to send 8x8 pixel pictures, which is then displayed by the NINA-B112 module. This procedure also works while the Surrli is spinning.

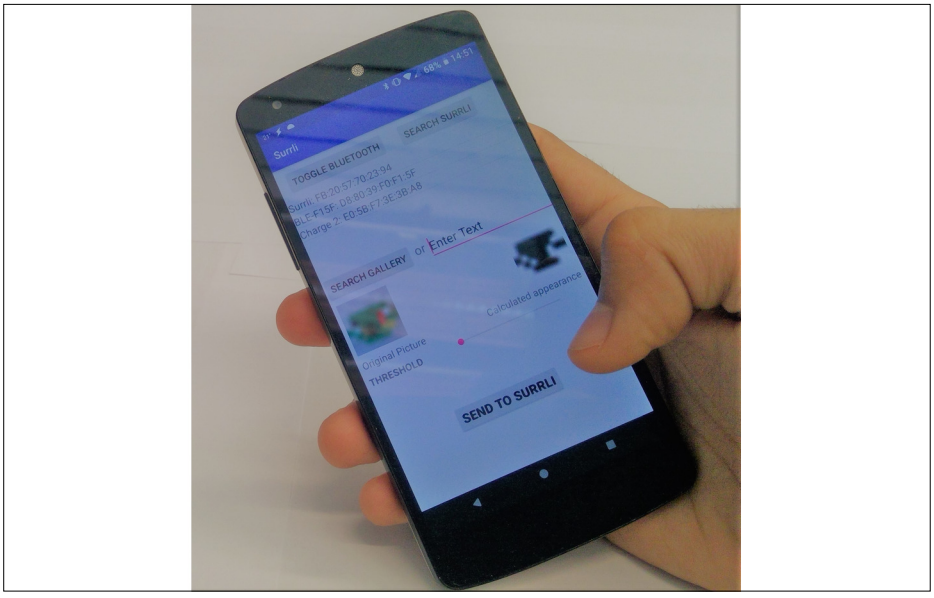


Fig. 3 Surrli is now programmable with an Android application