SOLENT UNIVERSITY

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CloudCue

Cloud-connected cue light system

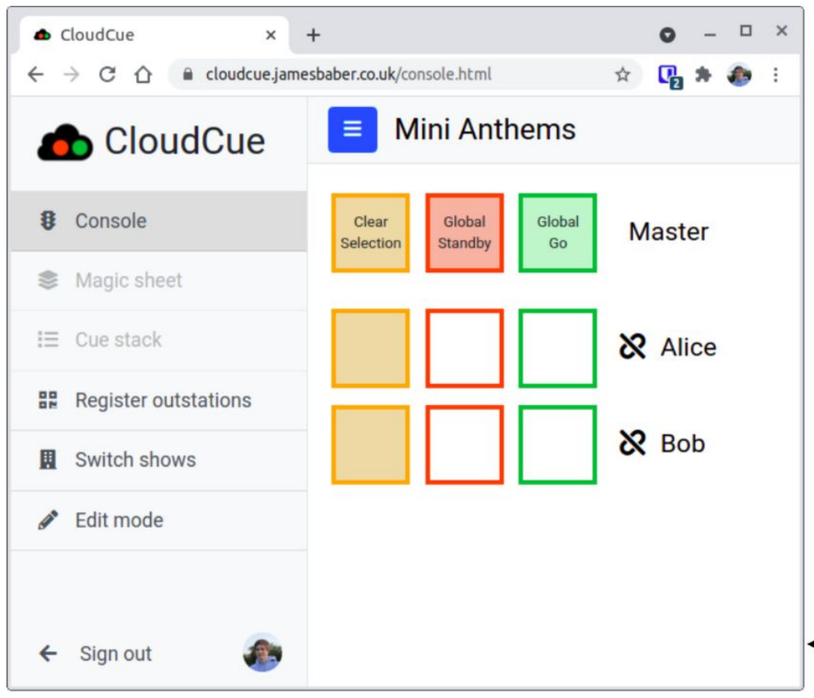
Background

Cue lights are an established technology with a long history that solve the problem of visual communication in theatre. The cuer, often the stage manager, uses a control panel to signal to crew members via light-up outstations.

Solutions range from toggled tungsten lamp circuits to fully featured Ethernet based solutions.

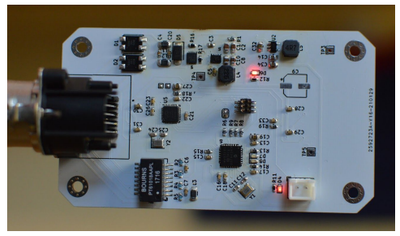
Aims

- Inspired by BPI's CineMiranda, the project aimed to build a plug and play solution that uses a web app based controller and physical outstations.
- QR codes were proposed to simplify the registration process.
- As there are additional failure points, clear message acknowledgement must be implemented.

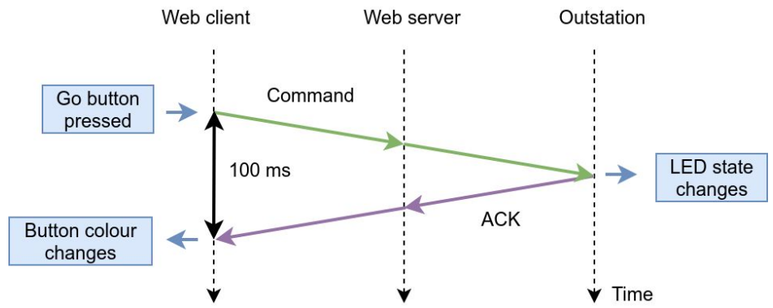


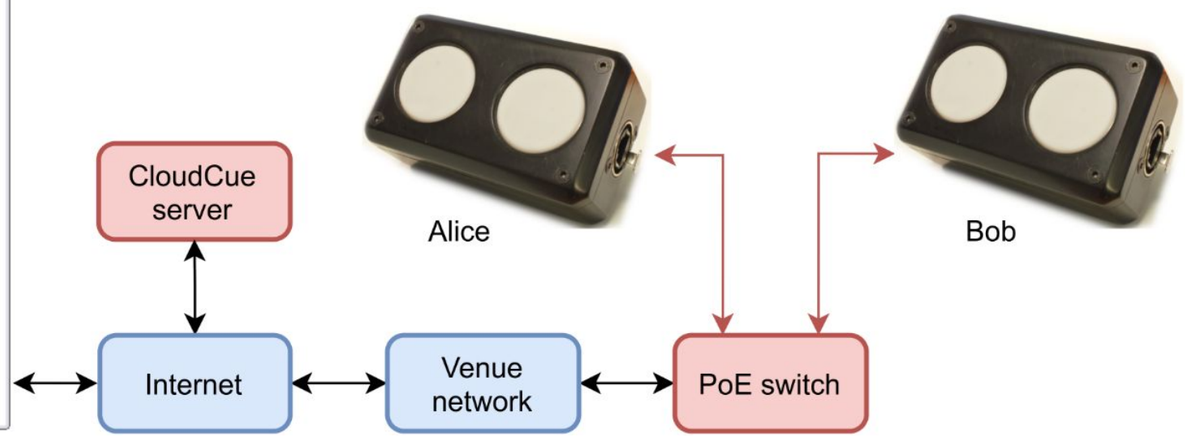
Hardware design

The outstations were 3D printed in 4 parts, contain the custom-made PCB and diffuse the light from the two pairs of RGB LEDs.



The delay between button click and LED state change is 50 ms which is similar to the inter-frame time of standard 24 fps video and is therefore negligible.





Code

The web application was built with Node.js, communicates with the web client with WebSockets and the outstations via raw TCP.

The web application was built with ease of use in mind. It works on desktop and mobile phones.

The outstation uses an ATmega microcontroller and communicates with the server via TCP.

Conclusion & Recommendations

All project aims were met and a fully functional prototype was built but some characteristics could be improved:

- Replace PLA enclosure with ABS and TPU for ambient temperature tolerance.
- Wi-Fi (or LoRa mesh) alternative to Ethernet for flexibility.
- LEDs appear bright indoors but an increase would improve operation in direct sunlight.
- Paint finish rather than labor intensive sanding and polishing.