

# EXPO

engineering  design

## OBJECTIVE

Create a robust, cost-effective, and portable multi-sport LED scoreboard.

## VALUE PROPOSITION

Our product

- Offers an affordable and enjoyable sports experience
- Encourages development of life skills
- Lowers financial barriers
- Provides fundraising opportunities

## BACKGROUND

Friday Night Flag is an NFL-affiliated league. FNF experiences issues with a product called the Lederbord.



- Expensive
- Slow boot cycle
- Flaky connection

## REQUIREMENTS



Weather Resistant



6-8 Hour Battery Life



200+ ft Connection Range



Quick Boot Cycle



Scrolling Advertisements

## ACKNOWLEDGEMENTS

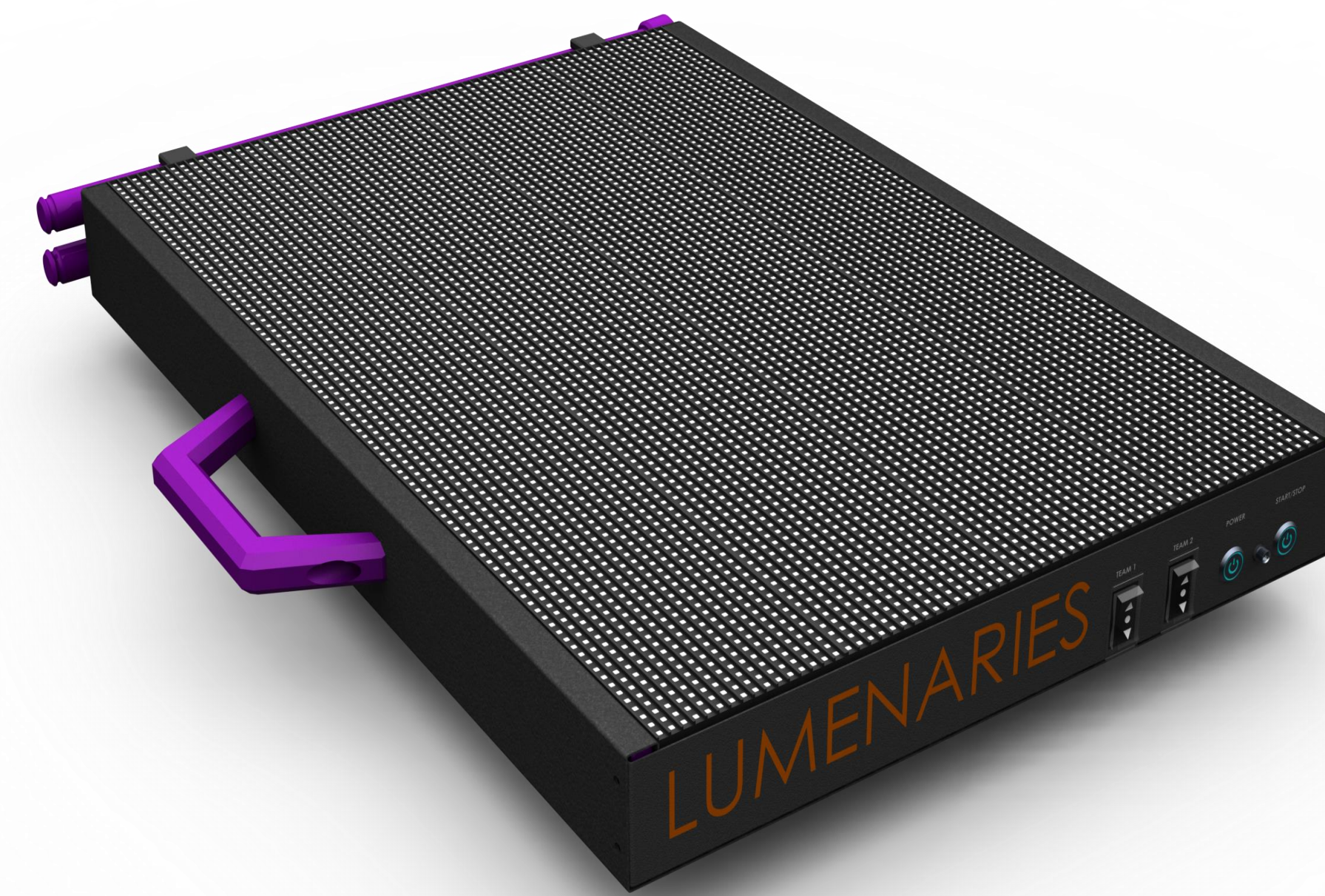
A special thanks to Reese Shurtliff, Kip Sikes, Sebastian Garcia, and Phillip Hagen!

# PORTABLE LED ATHLETICS SCOREBOARD

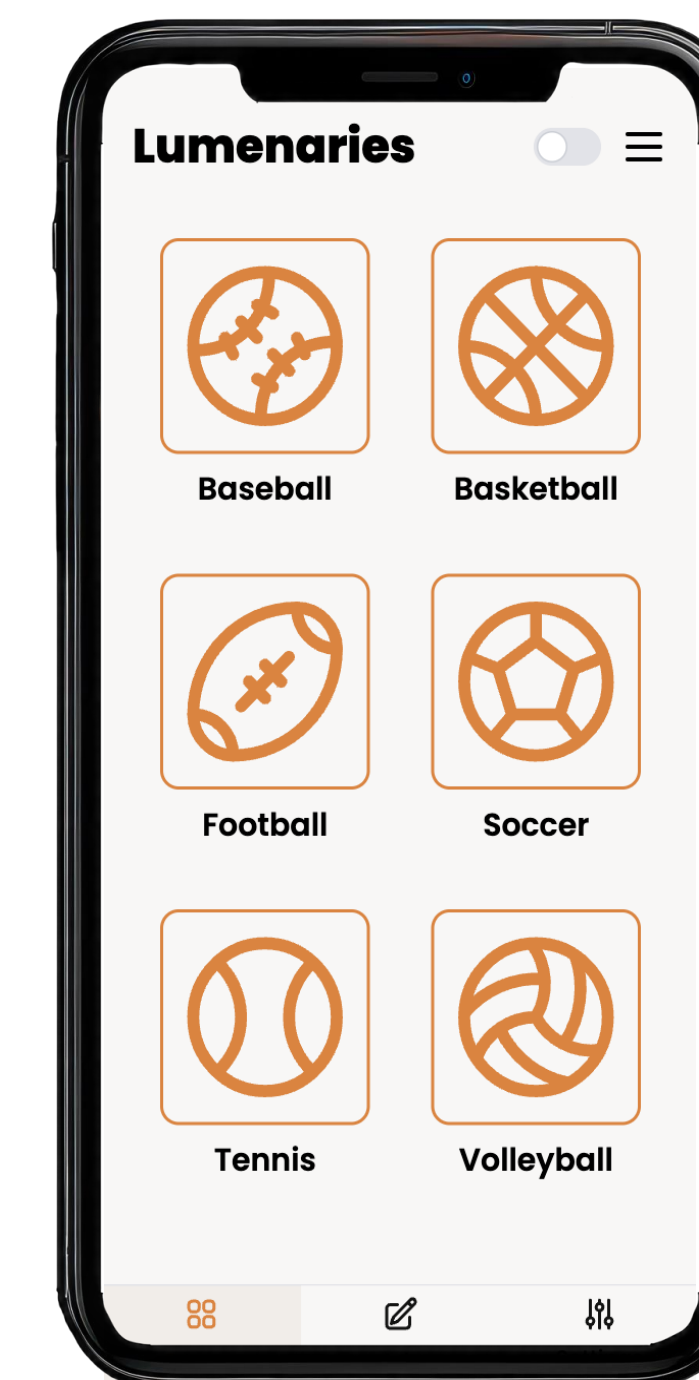
Jenna-Luz Pura [CS]   Yuhan Jing [EE]   Paul Martin [ME]  
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## SOLUTION

### Case Design

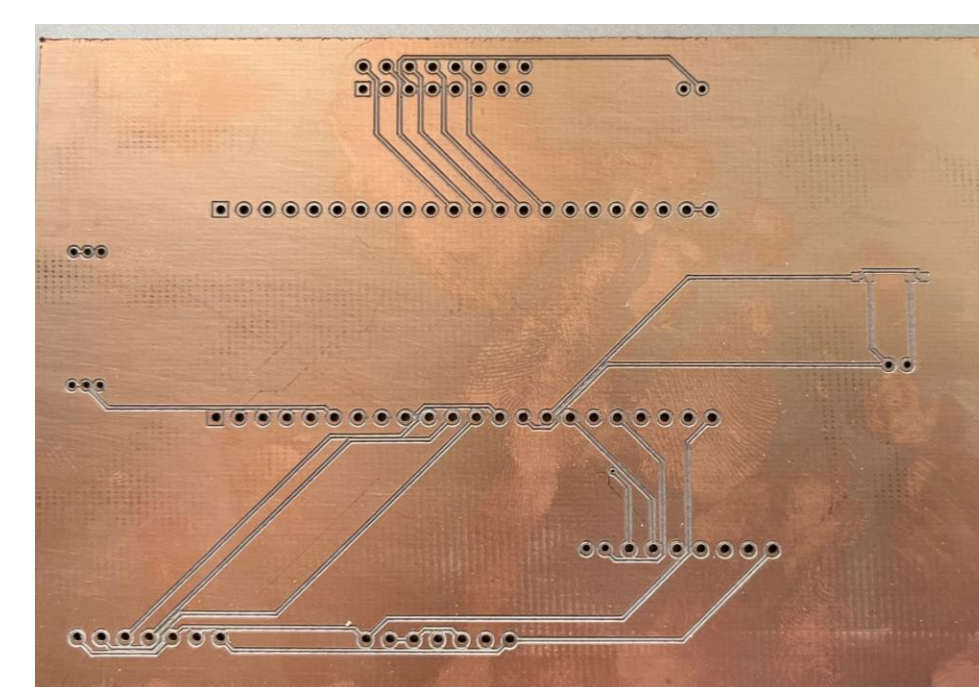


### User Interface



### 21700 Lithium-Ion Batteries

- 3.6 Nominal V
- 5Ah
- 10 Cells in Series
- Total 36V



### Printed Circuit Board



### Software Stack

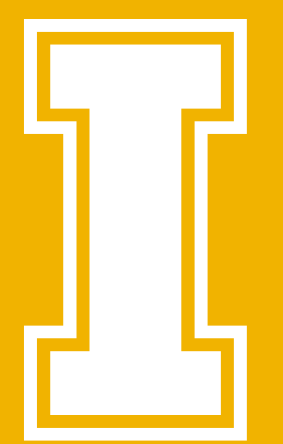


### ESP32-S3

- 36 GPIO Pins
- 240 MHz Dual Core
- 512 KB SRAM
- 2 MB PSRAM
- Onboard Antenna

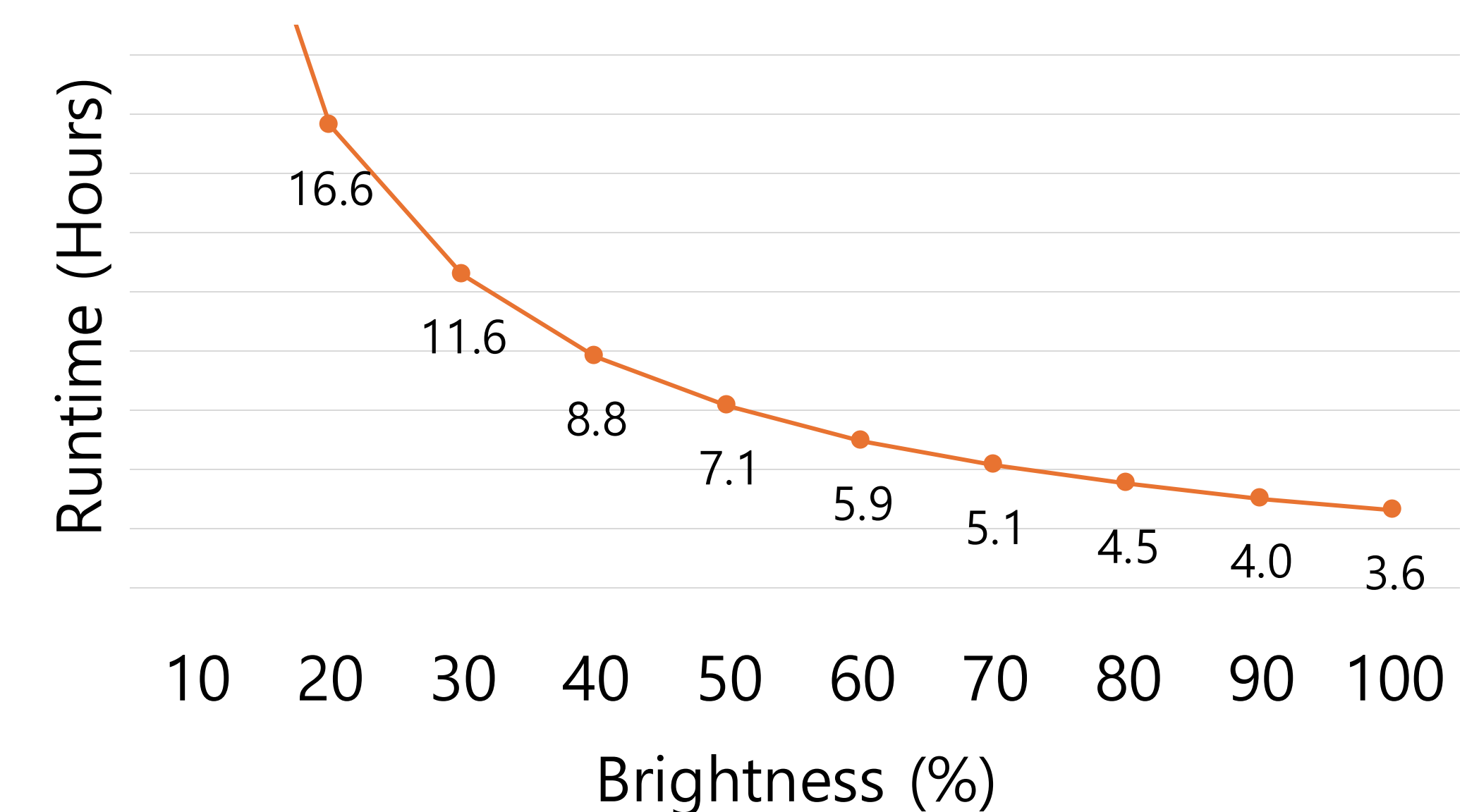
## FUTURE WORK

- Attach access panel to LED panel sliders
- Create a more visible font for the LEDs
- Implement wireless OTA updates
- Redesign case for expandability
- Simplify power delivery system

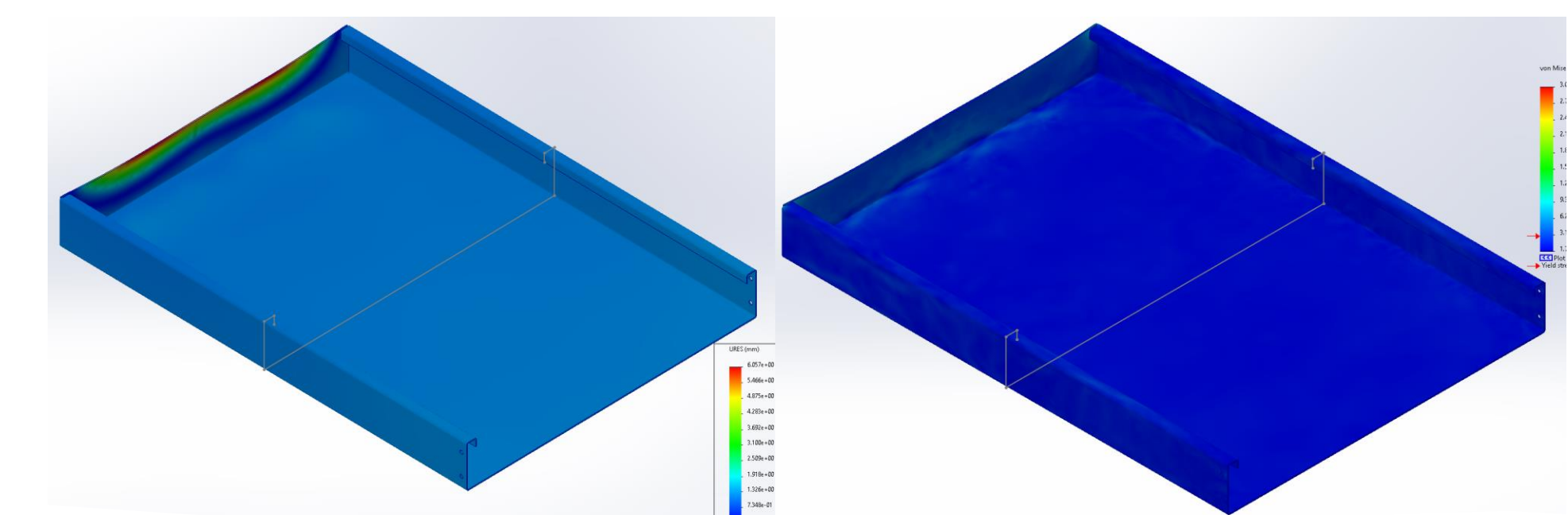


## VALIDATION

### Battery Life vs LED Brightness



### Finite Element Analysis



Displacement

Stress

### Wi-Fi Signal Strength vs Distance

