

# ColorNet

Consistent display of Clemson brand colors using artificial intelligence



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Assistant Professor Graphic Communications

Research Data Scientist, Watt Center for Innovation

**Emma Mayes**

Student Team Lead, Industrial Engineering Major

**Michelle Mayer**

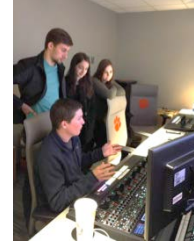
Student Team Member, Computer Engineering Major

**Andrew Sanborn**

Student Team Member, Computing Sciences Major

**John Paul Lineberger**

Student Team Member, Bioengineering Major



Corrected footage of the "Purple Out" game, Fall 2018

POPULAR ON TWITTER

Sierra  
Twitter - siernastubble

Clemson is looking good in Duke Blue tonight

22 minutes ago

POPULAR ON TWITTER

Chip Acker  
Twitter - ChipAcker

Hey @ESPNCFB @ESPN can you send a truck engineer that knows how to white balance a camera to Clemson? Our purple uniforms look like Florida blue. #ESPNfail

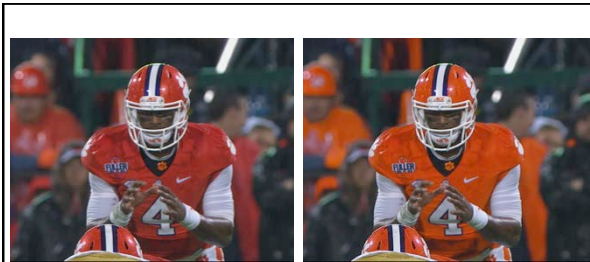
36 minutes ago

Katherine Fitzgerald  
Twitter - kftz134

hello @11, the color balance has clemson looking like they're playing in duke blue, plz advise???

34 minutes ago

The fans notice



Corrected footage 2015 Notre Dame game with an orange uniform

Kimberly Hyatt  
@kimberlyhyatt

Oy, The color is off on our TV. The Clemson uniforms look like UF Gators! I'm going to have to concentrate on this game. 🙄🙄

7:19 PM · Nov 17, 2018 · Echofon

1 Like

Bonnie Upright, APR  
@bonnieupright · Nov 17, 2018

Replying to @kimberlyhyatt

We said the exact same thing! I walked in, looked at the tv and said "but we already played today!" 🙄🙄

1 Like

Mike C  
@security\_mike\_c · Nov 17, 2018

Replying to @kimberlyhyatt

It's not your TV... just another flawless ESPN executive lol\_ The grass doesn't even look right.

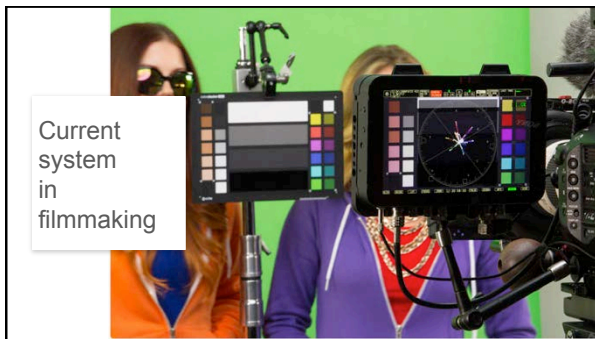
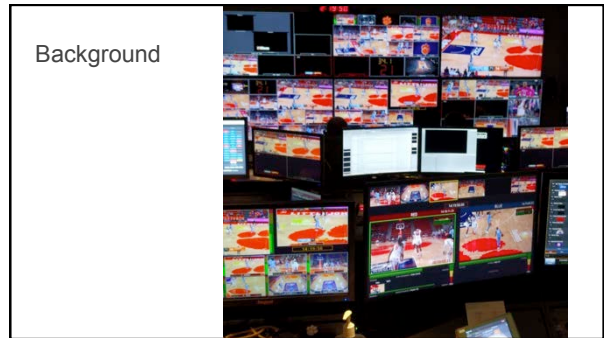
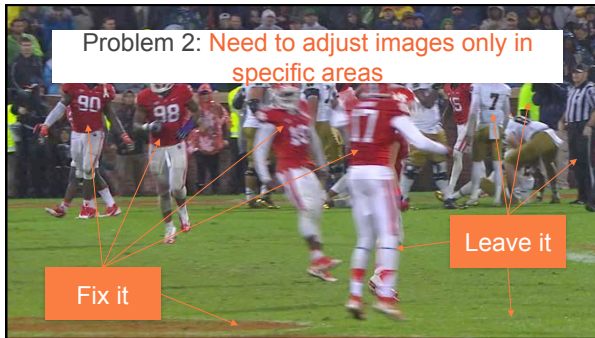
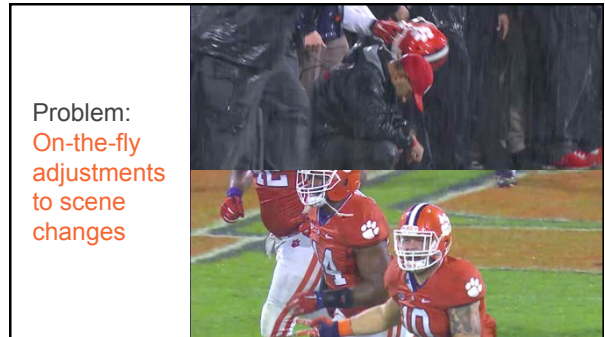
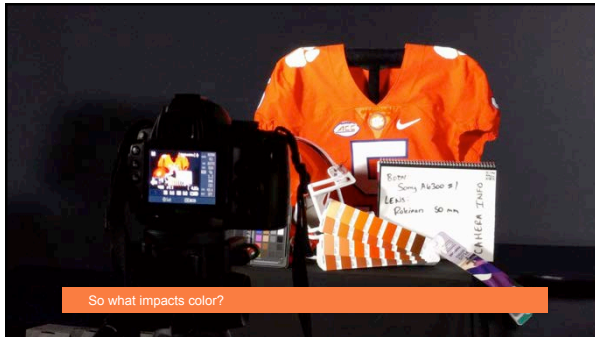
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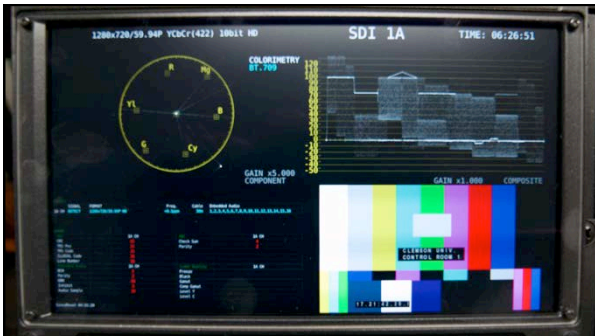
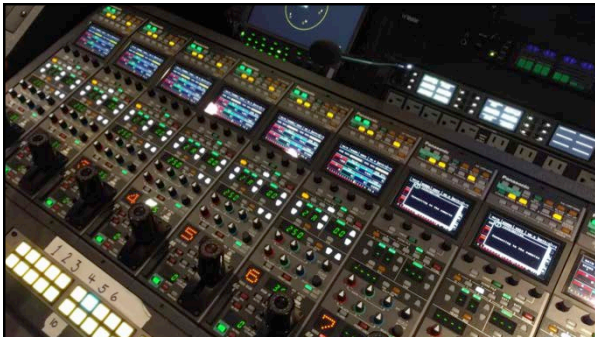
sim fearney  
@simfear

Turned on tv to watch #clemson v #OK, but looks like they're replaying #Falcons v Carolina. worse, something's wrong with tv color.

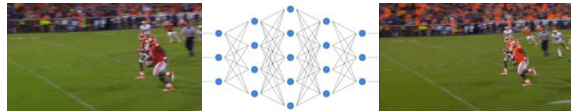
6:43 PM · Dec 25, 2018 · Twitter for Android

The fans notice

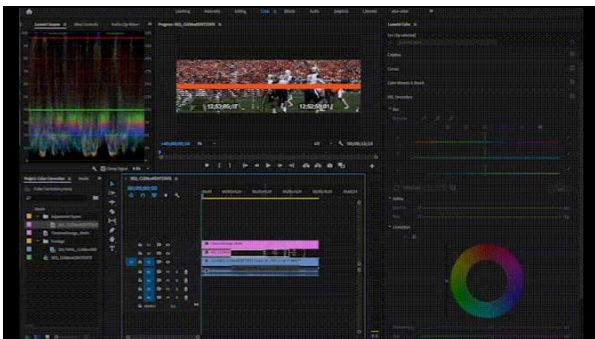




### Artificial Intelligence Approach



- Create a data set**
- Train the algorithm**
- Apply to video frames on the fly**



### ColorNet: Automate Brand Color Adjustment with AI



Above: An example of a color-incorrect image on the left, a corrected image in the middle, and the corresponding correction mask on the right.

Rabbit -> Polar bear (prototype to production-level device)



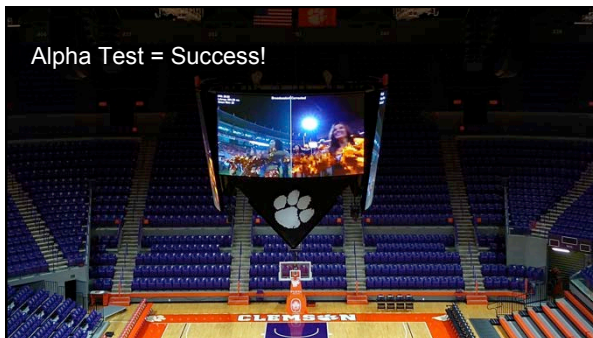
Prototype device: Nvidia Jetson Nano:

Resolution	FPS
360p	36
720p	12
1080p	6.5

Production device: achieves 60+ FPS on 1080p footage

DEMO TIME

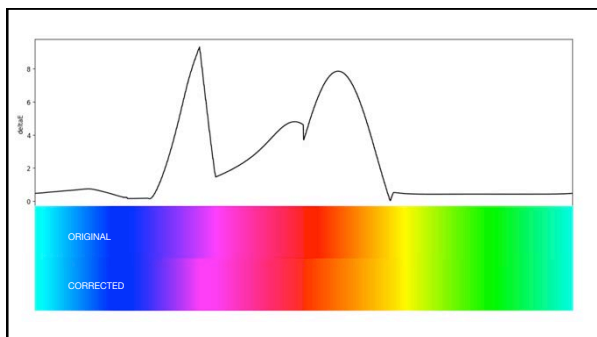
Alpha Test = Success!

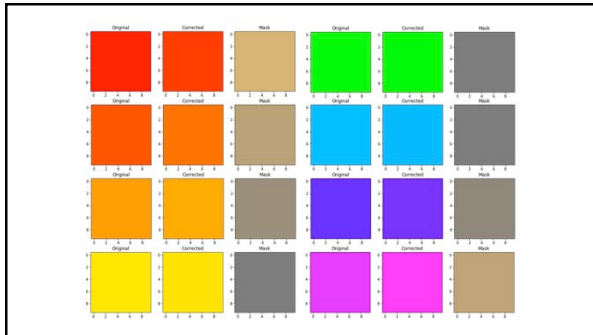


Be

### Measurement

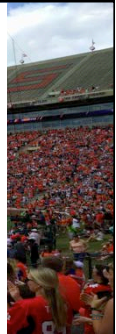
- Are we on target with which colors we are manipulating?
- Are we on target with the extent of color changes?
- How can we measure the effectiveness of ColorNet?





### Next steps with the research

- Beta test, part 2
- Continue refining the model & measurement tool
- Add colors to the model (purple, white)
- Patent cycle
- Conversations with industry segments



### Implications

- Screen & projection technology
- Brand communication
- Color management
- Medical imaging
- others?

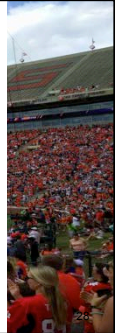


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### Many thanks to...

- Clemson Athletics
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- Planar
- Daktronics
- Adobe



# Thank you!

Assistant Professor Graphic Communications  
 eblack4@clemson.edu

Research Data Scientist, Watt Center for Innovation  
 dane2@clemson.edu