Using color blindness simulator during user interface development for accelerator control room applications.

Aytac, Sakire (DESY, Hamburg, Germany)

Color Blindness / Color Vision Deficiency (CVD)

Our human eye contains millions of light-sensitive cells called photoreceptors. Rods are responsible for detecting brightness and cones are sensitive to three certain wavelengths. The mixture of those three different cone types generates our color vision. If any of these cone types is malfunctioning or missing, causes in color blindness (also known as color vision deficiency).

Avoid colors with important information
Increase contrast between similar colors
Try to use a limited number of colors
Lighten light colors and darken the dark ones
Label colors with text or symbols

Simulation tools to validate if our design is accessible

Several software tools exist to visualize colors as they are perceived with different types of color vision deficiency. These simulators are available as web applications, smartphone apps, rich client applications, libraries, and as plugins.

Being aware of color blindness in user interface design -> get a enhanced sensitivity on selecting colors

We discovered that adjusted colors for accessibility do not lead to a loss of aesthetic integrity of a design. Simulators helped us to get a good impression of how people with CVD see colors.

For normally sighted developers it is hard to imagine how the user interface is going to look to a color blind person.

Approximately 8% of all men and 0.5% of all women worldwide are affected by color blindness.

In most cases CVD is the result of defects in the genes. Unfortunately people with color vision deficiency even do not know that or they are ashamed outing it. This has a significant impact on their private and business lives.

Red-Green is the most common type of color blindness

To produce more effective visualizations, we need to devise techniques helping these people.

Applying the mentioned CVD friendly design practices and using simulators as assistance offer us the opportunity to be creative.