Design of Web Applications with Support for Color-blind Users

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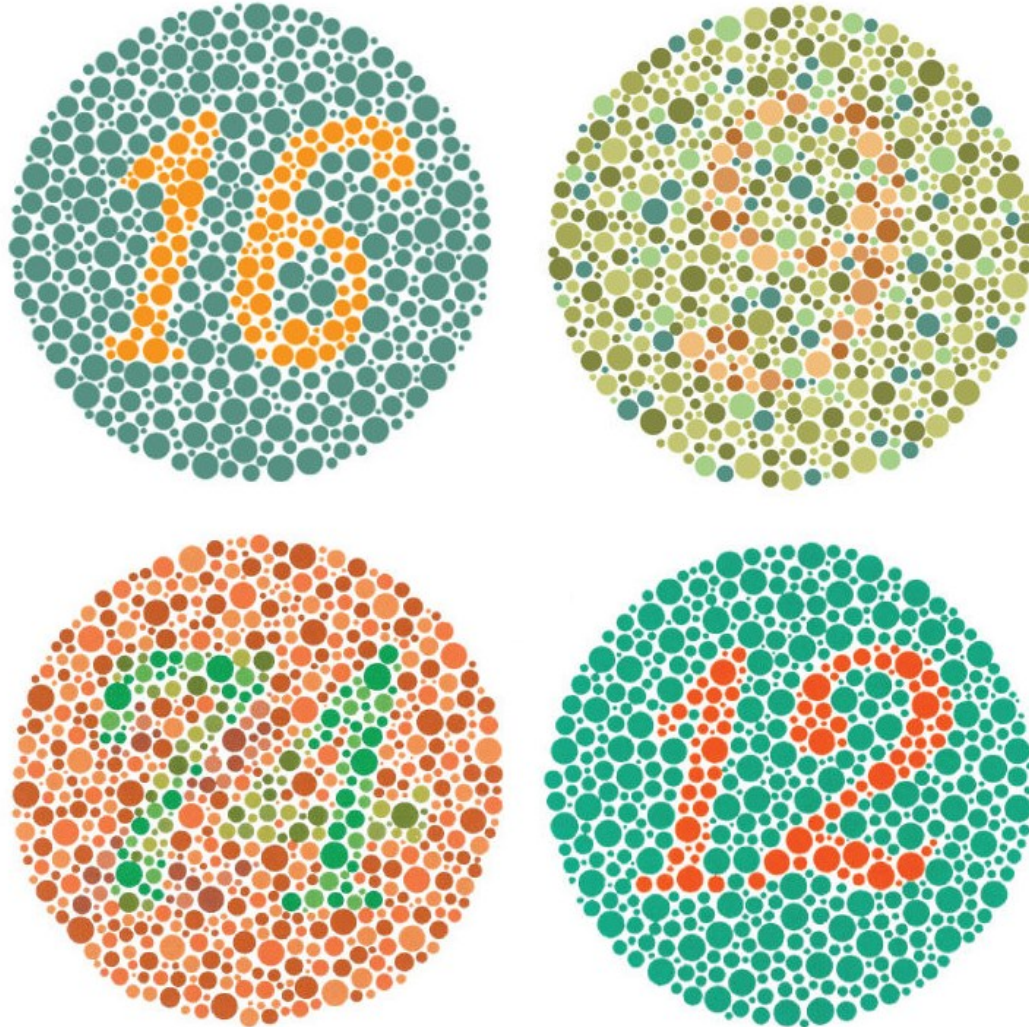Faculty of Economics

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Outline

- Color blindness
- Recomendation for web design
- Tools for testing

Color blindness

- Protanopia (Protanomaly) – red color

- Deuteranopia (Deuteranomaly) – green color

- Tritanopia (Tritanomaly) – blue color

Normal view

Ishihara's test for detection color blindness

Distribution of color-blindness in population

Type	Denomination	Prevalence	
		Men	**Women**
Monochromacy	Achromatopsia	0.00003%	
Dichromacy	Protanopia	1.01%	0.02%
	Deuteranopia	1.27%	0.01%
	Tritanopia	0.0001%	
Anomalous Trichromacy	Protanomaly	1.08%	0.03%
	Deuteranomaly	4.63%	0.36%
	Tritanomaly	0.0002%	

- In total 8 % of men and 0.5 % of women are suffering from some type of color vision deficiency

Web design – color pairs that color blind people cannot distinguish
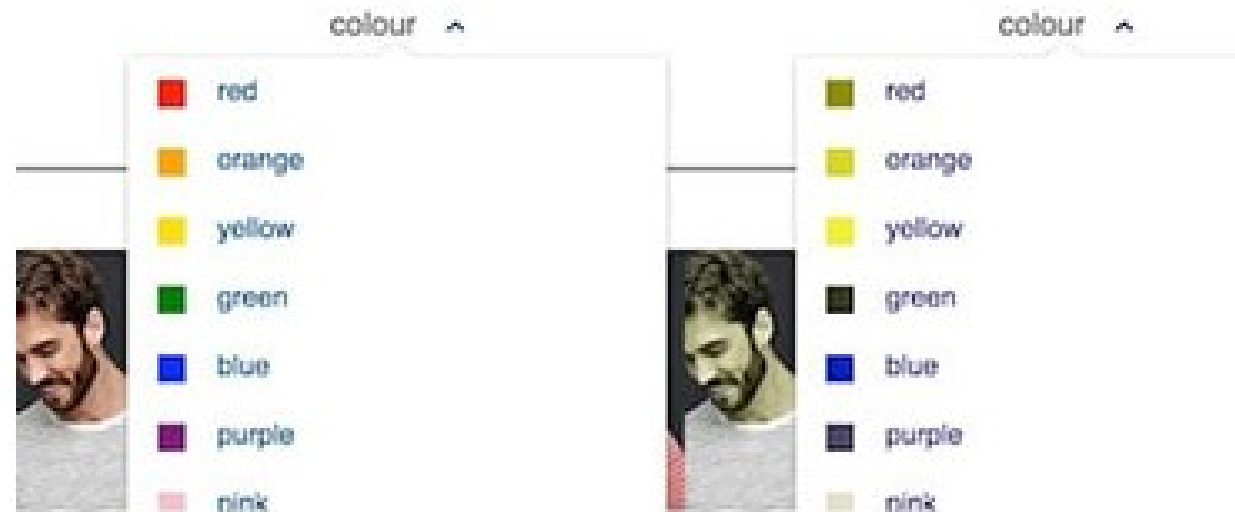
Recomendation for web design

- Avoid some color combination

- Keep color palette limited (2 or free colors)

- Use high contrast

- Use thicker lines

- Use both color and symbols

- Links on a web page should be underlined or represent by icons (not only by differenrt colors)

Example of good and bad contrast

Source: https://gomedia.com/tutorials/rule-three-contrast-contrast-contrast/

Example of solution of color selection

- W3C - Web Content Accessibility Guidelines (WCAG) 2.1

Tools for testing

Tool	Source	Note
Color Oracle	http://colororacle.org/	Windows, MAC, Linux; free tool, full screen color filter
Coblis – Color Blindness Simulator	http://www.color-blindness.com/coblis-color-blindness-simulator/	Drag and drop files for testing
TPGi Colour Contrast Analyser	https://www.tpgi.com/color-contrast-checker/	Free color contrast checker tool; Windows and MAC; test compliance with WCAG 2.1
Tanaguru Contrast Finder	https://contrast-finder.tanaguru.com/	WCAG criteria checker
Color Safe	http://colorsafe.co/	Tool for adjustment a contrast in web design
ColorBlind A11Y Assistant		Chrome extension
Colorblind Web Page Filter	https://www.toptal.com/designers/colorfilter	

Conclusion

- Color vision deficiency users may experience limitations and barriers in exploring web pages, even for simple task

- This contribution attempts to help web developers to create web applications that reflect the specific needs of people with color vision deficiency

IT for Practice 2021

Thank you for attentions....