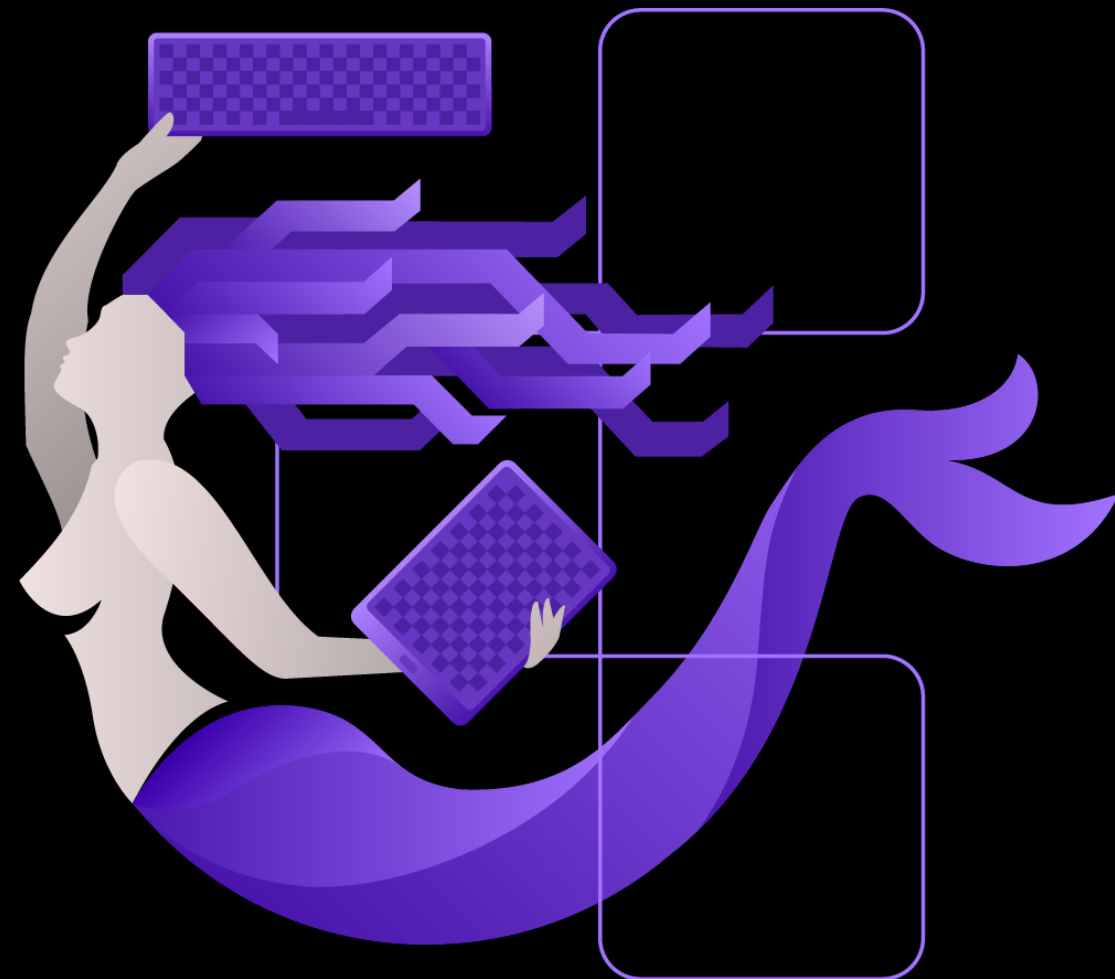




Error 404: Color not found

Dennie Declercq
IT-Coach DDSoft



MAIN ORGANIZER: **AcademicPartners**
FUNDACJA

ORGANIZING COMMITTEE: dozens of organizations from the IT / data science sector (full list on the event website)

@DennieDeclercq




Who am I?

- Dennie Declercq
- President, IT-Coach & Developer DDSOFT
- Microsoft MVP
- Mr. #DreamingIsBelieving
- @DennieDeclercq

An abstract background on the left side of the slide. It features a dark, textured surface with several bright, overlapping light rays in shades of purple, blue, green, and yellow. These rays converge towards a central, semi-transparent square that has a subtle gradient and a slight 3D effect.


Content

- Accessibility
- Color Contrast
- Implementation (WCAG)
- Tools & Demo's



What is Accessibility?

- People with all needs can access:
 - Internet
 - Daily life activities
 - All areas

A hand with a black silhouette is pointing towards several colorful sticky notes (yellow, white, blue, purple) on a dark wooden surface. Each sticky note features a simple black outline of a person. The notes are scattered and slightly overlapping.

The importance of Accessibility & Inclusion

- **Inclusion** = All people are living together in the same environment.
- When people depend on others to have access for their needs, they are **excluded**.
- If your communication* is not accessible, then it leads to **exclusion**.
- * Communication examples: websites, apps, leaflets, commercials, banners, posters, (info)graphics.

The business side

If your commercial is not accessible for all people, than they can't buy your product.

An inaccessible website can prevent people to buy the product/ service.

1 on 3 men are colorblind.

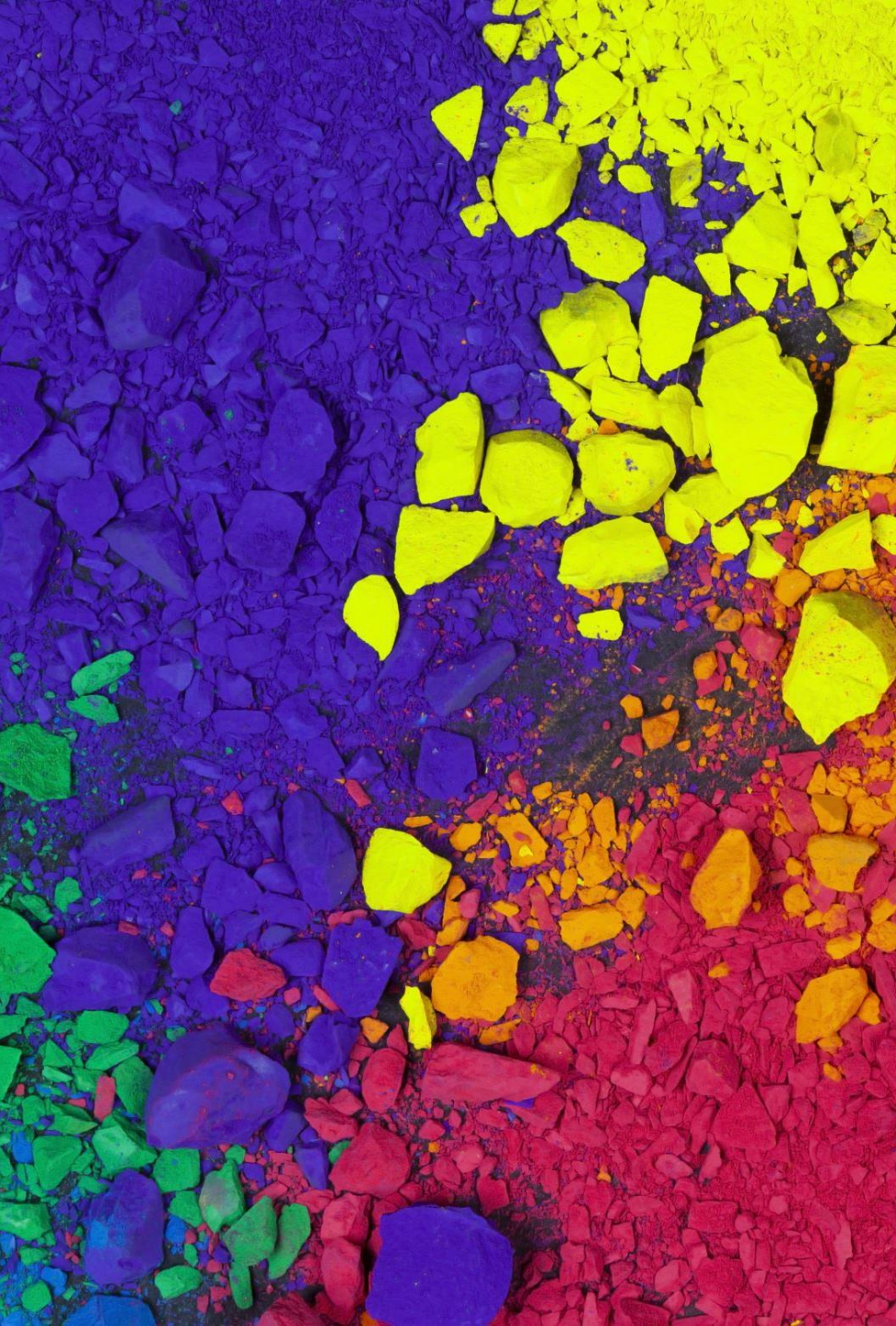
A lot of people (with elderly) have a visual impairment

“Even I look until my eyes hurt on a digital or physical folder!”-Dennie



Visual Impairment

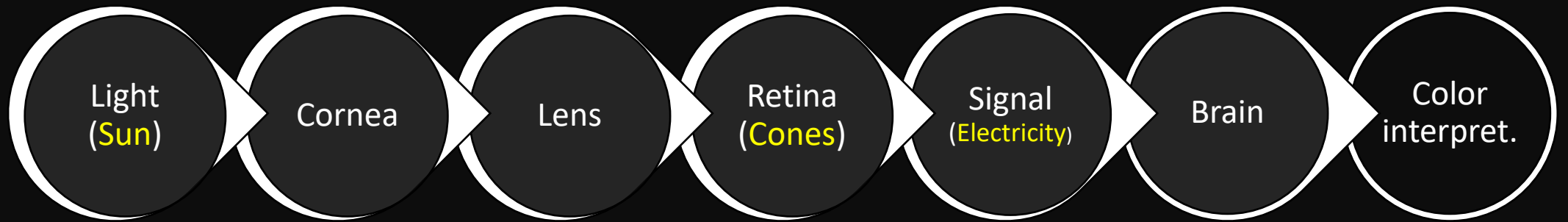
- Worst eye: <50%



Color blindness

- Difficulties with distinguishing color
- 1684: Dr. Turberville
- 1794: Daltonism (John Dalton)
- Deficiency in Color Cones

How we see color: It's all about signals



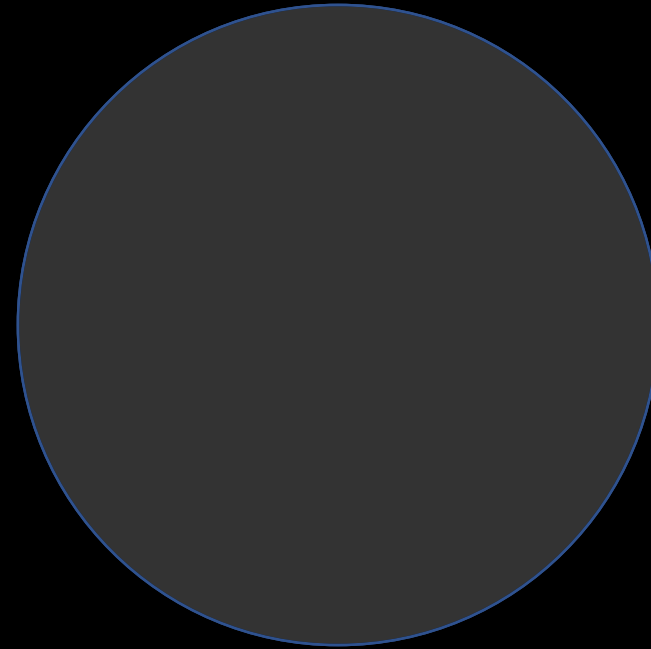
Luminance

- How many light comes from in
- Measured by:
 - Cone type
 - On a scale



Luminance input & output (B/W)

- Luminance 20%



Luminance & Luminance output (R/G/B)



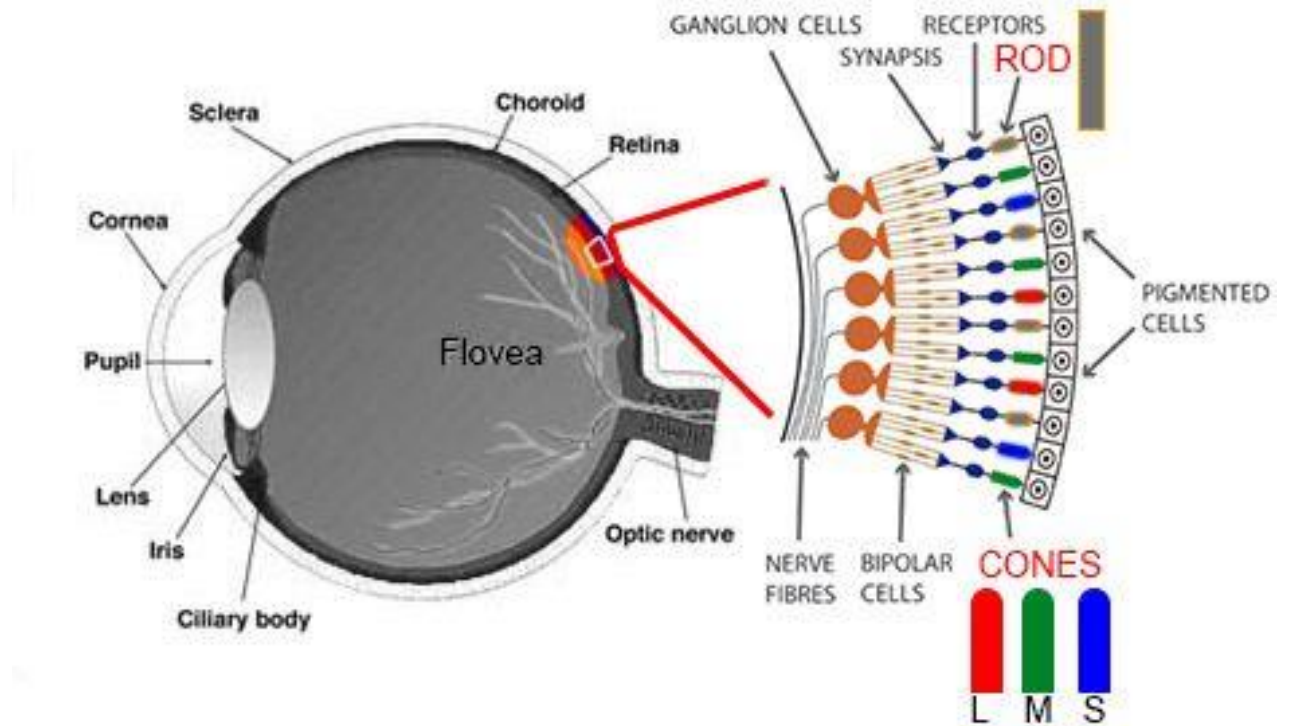
- Luminance 20%

Luminance ratio's

- Relative Foreground
- Relative Background

How we see colors: Color Cones

- Red: Prot
- Green: Deuter
- Blue: Trit



© www.theinkrag.com/colour_blindness/monochromacy.html



How we see colors: Terminology

- Anopia: Missing cone(s)
- Anopsia: Good working cone(s)
- Anomaly: Dysfunctioning cone(s)

Trough the eyes: Normal vision

- © Images:
<https://www.colourblindawareness.org>



Trough the eyes: Protanopia

- © Images:
<https://www.colourblindawareness.org>



Trough the eyes: Tritanopia

- © Images:
<https://www.colourblindawareness.org>



Trough the eyes: Deutranopia

- © Images:
<https://www.colourblindawareness.org>



DEMO: Windows 10 Color filters

Web Content Accessibility Guidelines (WCAG)

1. Perceivable

2. Operable

3. Understandable

4. Robust

1. Text Alternatives

2. Time Based Media

3. Adaptable

4. Distinguishable

A
AA
AAA

1.4.1: Use of Color – Level A

- Color is not the only way of conveying information

1.4.3: Contrast (Minimum) – Level AA

- 4.5:1
- Except
 - 3:1: Large text
 - None:
 - Incidental
 - Logo

WCAG 1.4.6 – Level AAA

- 7:1
- Except
 - 4.5:1: Large text
 - None:
 - Incidental
 - Logo

1.4.11: Non-text Contrast – Level AA

- 3:1
- Except
 - None:
 - UI: Inactive Components
 - UI: Not meant to adjust
 - Non-essential graphical objects

Summary Contrast Ratio's

Important Ratio's

- 3:1
- 4.5:1
- 7:1

Formula

$$(L1 + 0.05) / (L2 + 0.05)$$

L1: Relative luminance of the lighter of the colors

L2: Relative luminance of the darker of the colors.

Questioning WCAG

Logotypes: Text that is part of a logo or brand name has **no contrast requirements**.

- Are logo's recognizable if people have difficulties distinguishing color?
- What about too low contrast between logo (text) and background?
- Is company name/ detail still readable?

Testing for Color Contrast:

Adobe Color Contrast
Analyzer (Design Phase)

Microsoft Accessibility
Insights (Develop/ Test Phase)

WCAG Contrast Checker
(Develop/ Test Phase)

DEMO: Adobe Color Contrast Analyzer (Design Phase)

<https://color.adobe.com/nl/create/color-contrast-analyzer>

DEMO: Microsoft Accessibility Insights (Develop/ Test Phase)

<https://accessibilityinsights.io>

DEMO: WCAG Contrast Checker (Develop/ Test Phase)

<https://go.ddsoft.be/WCAGColorChecker>

Recap

- I told about Accessibility & Inclusion
- I gave insights in Color Vision Deficiencies (Color Blindness)
- I showed tools how to handle accessible colors



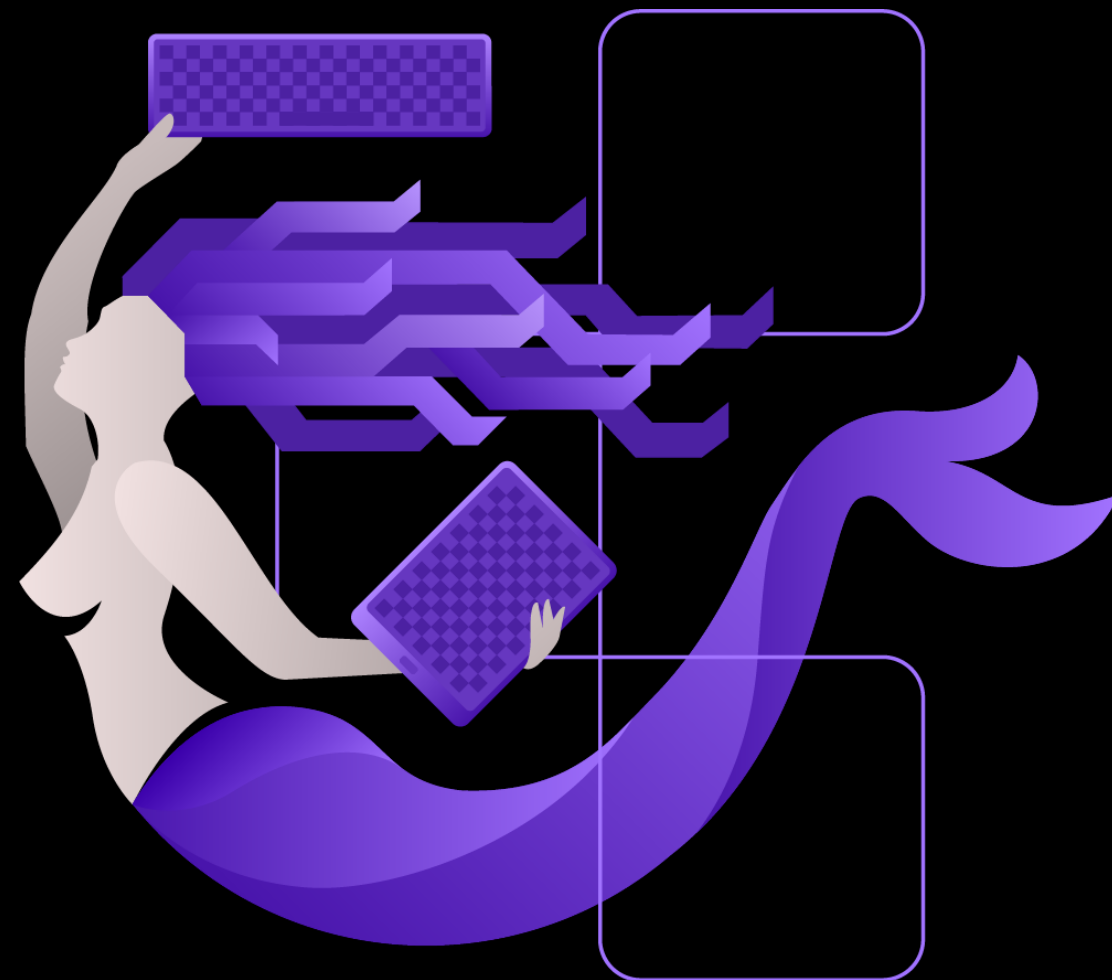
Thanks || Q&A

- Dennie Declercq
- Dennie@DDSoft.be
- @DennieDeclercq



Thank you for watching!

Remember to rate the presentation and
leave your questions in the section below.



www.WarszawskieDniInformatyki.pl



31 March - 1 April 2023



Politechnika Warszawska + online

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