



# Error 404: Color not found

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Dennie Declercq // [Java Forum Stuttgart](#) // Juli 2023



Intro

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, pink, orange, and blue. These rays converge towards a central point where a small, semi-transparent square is located. The square has a gradient of colors, including blue, green, and yellow, and appears to be a focal point for the light rays.

# Content

- Intro
- Intro to Accessibility
- Color Contrast
- Outro



# Who am I?

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






# Intro to Accessibility








# What is Accessibility?

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



# 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

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

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

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1 on 3 men are colorblind.

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

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

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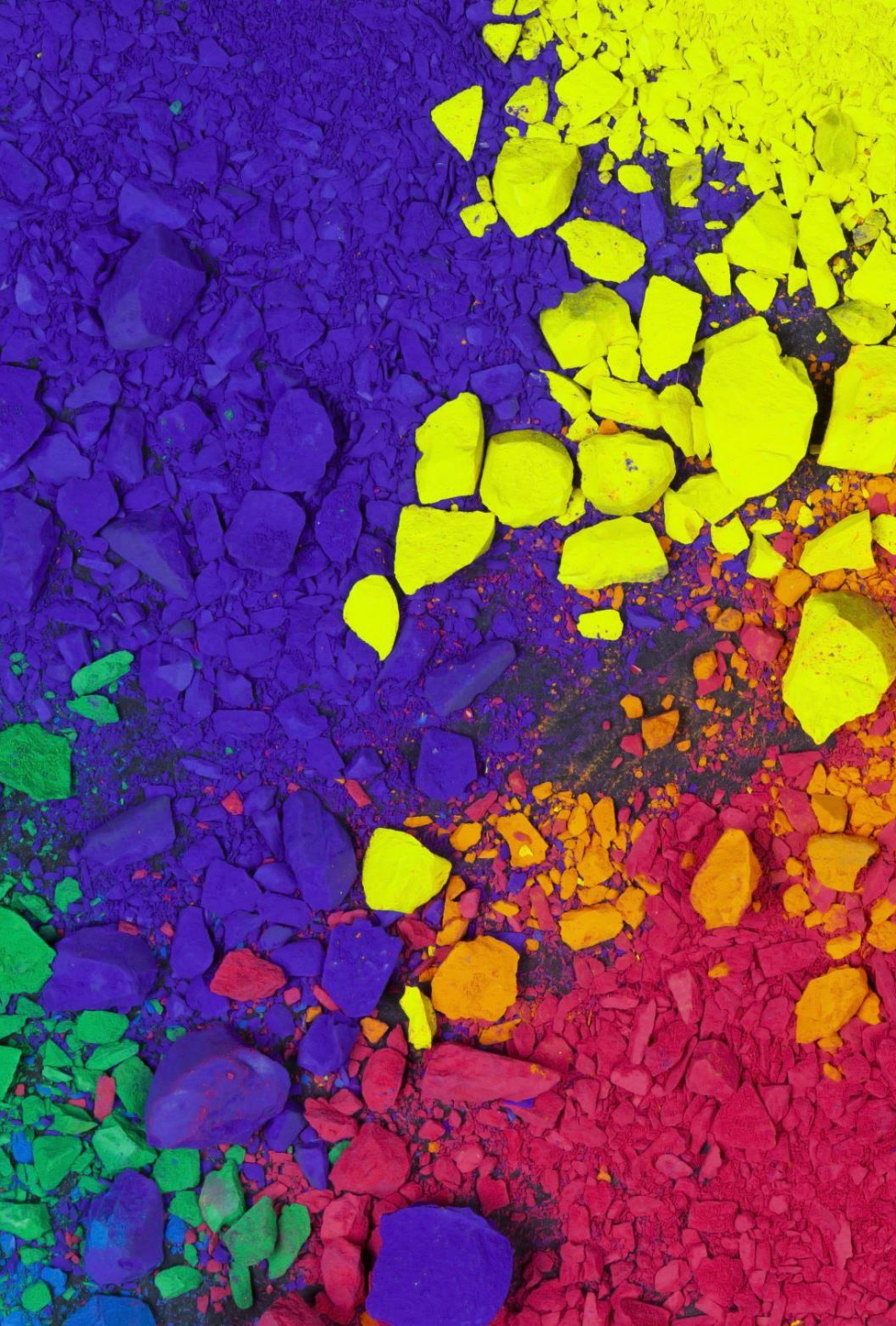




# Visual Impairment

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- Worst eye: <50%



# Color blindness

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

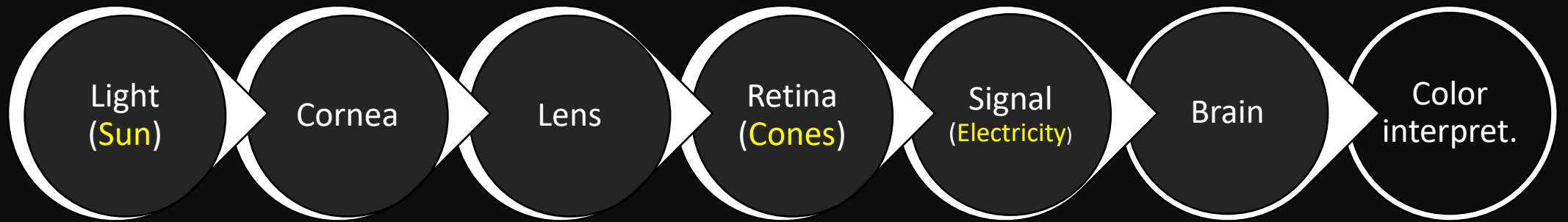




# Color contrast

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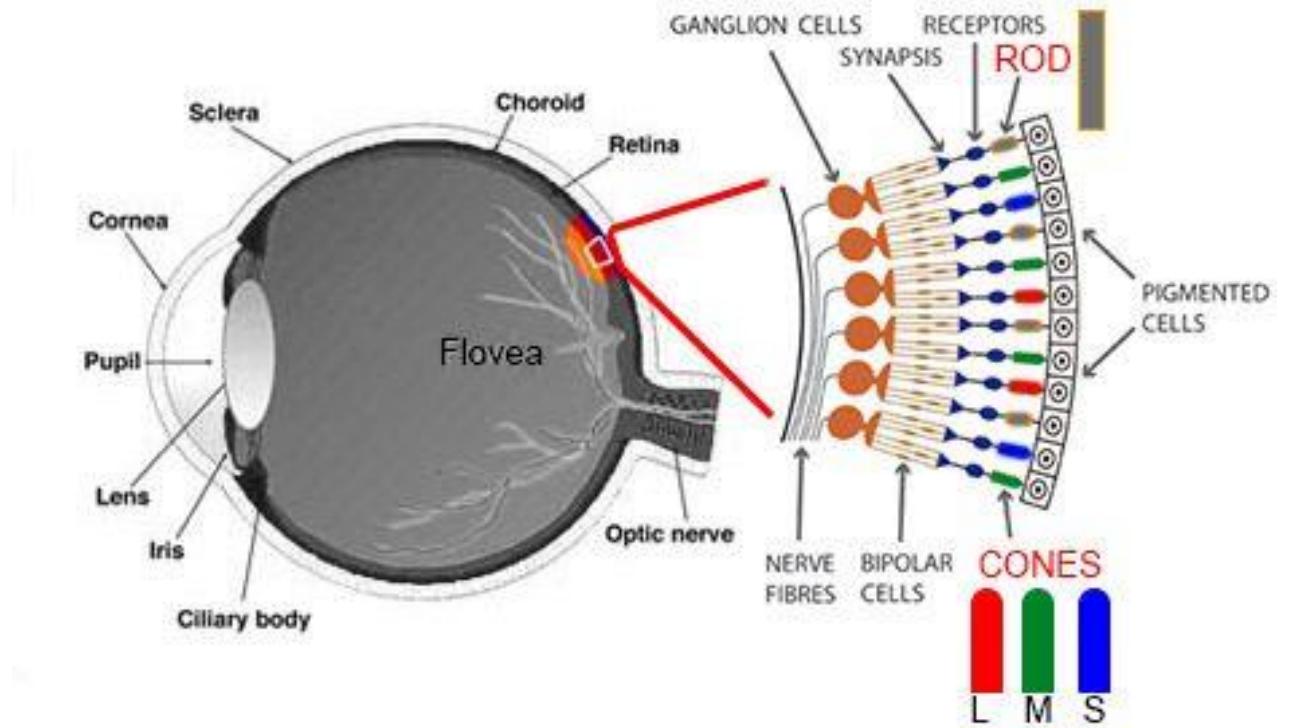
# How we see color: It's all about signals





# How we see colors: Color Cones

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



© [www.theinkrag.com/colour\\_blindness/monochromacy.html](http://www.theinkrag.com/colour_blindness/monochromacy.html)

# Luminance

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







# How we see colors: Terminology

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

# Examples: Protanopia

**Normal vision**



**Protanopia**



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

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# Examples: Tritanopia

**Normal vision**



**Tritanopia**



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# Examples: Deutranopia

**Normal vision**



**Deutranopia**



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# Examples: Monochromacy

**Normal vision**



**Monochromacy**



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# 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

# Contrast Ratio

## 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.



## 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

# 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:

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Adobe Color Contrast  
Analyzer (Design Phase)

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Microsoft Accessibility  
Insights (Develop/ Test Phase)

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WCAG Contrast Checker  
(Develop/ Test Phase)

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# DEMO: Adobe Color Contrast Analyzer (Design Phase)

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

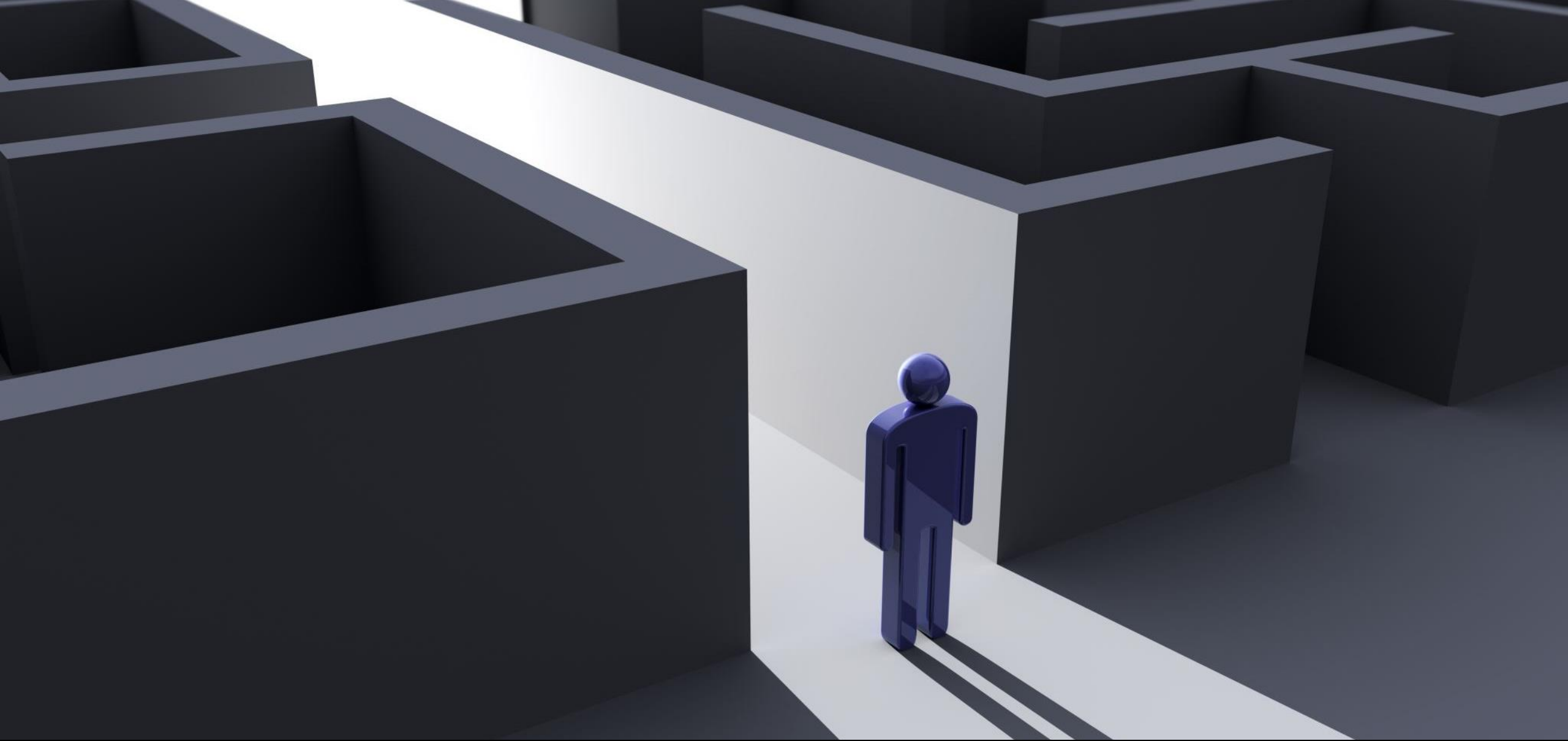
# DEMO: Microsoft Accessibility Insights (Develop/ Test Phase)

<https://accessibilityinsights.io>

# DEMO: WCAG Contrast Checker (Develop/ Test Phase)

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





Outro

# 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

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