



# IMPROVING USABILITY WITH ACCESSIBILITY

Kim Vassiliadis, UNC-Chapel Hill



# Hello

I'm Kim Vassiliadis





Quiz!

How many people in the U.S. are estimated to have disabilities?

- A. Hundreds
- B. Thousands
- C. Millions

Test your knowledge



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*56 Million people / 19% of the population*

Test your knowledge

# Which company had a web accessibility suit filed against them?

- A. Peapod
- B. E\*Trade
- C. Winn Dixie
- D. Five Guys
- E. Netflix
- F. Target
- G. Miami University
- H. Seattle Public Schools
- I. H&R Block
- J. All of the Above

Test your knowledge

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***J. All of the Above***

Test your knowledge

# Which statement is true?

- A. It's recommended to use text whenever you can, versus using an image of text.
- B. Text should be able to be resized to 100% and be seen in a full-sized window without having the user scroll horizontally to read the information.
- C. As long as the foreground and background are different colors, it's considered accessible.
- D. Form instructions should be at the end of a form.

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Test your knowledge

# The law

- Public Institutions have a legal requirement to make digital resources accessible.
- Subject to many requirements, chief among them:
  - Section 504 of the Rehabilitation Act of 1973
  - Section 508 of the Rehabilitation Act Amendments of 1998,
  - Title II of the Americans with Disabilities Act of 1990
- Expectation: Meeting Web Content Accessibility Guidelines (WCAG) 2.0
  - international guidelines established by the Web Accessibility Initiative (WAI) of the Worldwide Web Consortium (W3C)

“Provide the same means of use for all users: identical whenever possible; equivalent when not.”

From the Seven Principles of Universal Design, NC State University College of Design

In the physical world.....



# Wilson Library





# Wilson Library Side door

Equivalent access but sub-optimal user experience.





# Undergraduate Library



# Quote

“It’s easier to build a new building correctly than to renovate an old one, New buildings have to be created with elevators and ramps to assist people with disabilities, and websites should be thought of in the same way.”

Elizabeth Pyatt, Instructional Designer  
Penn State University

In the digital world...

# Accessibility myths

- Accessibility only benefits blind or vision impaired users.
- Accessibility means text-only, dull, and boring sites.
- Building an accessible site is expensive.
- People should view a website the way the designer intended.



# Eat your veggies approach to accessibility



# Four Principles of Web Accessibility:

- **Perceivable** - Information and user interface components must be presentable to users in ways they can perceive.
- **Operable** - User interface components and navigation must be operable.
- **Understandable** - Information and the operation of user interface must be understandable.
- **Robust** - Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.



# Accessibility improves usability

“While accessibility focuses on people with disabilities, many accessibility requirements also improve usability for everyone.

W3C - Web Accessibility Initiative

# Disabilities are not binary

- **Permanent:** A defining characteristic of the person's body.
- **Temporary:** An injury, sickness, or short-term impairment.
- **Situational:** A condition or context that limits a person's ability.

# Mobility/touch ability spectrum



## PERMANENT

A person who cannot use their hands



## TEMPORARY

A person with an arm injury



## SITUATIONAL

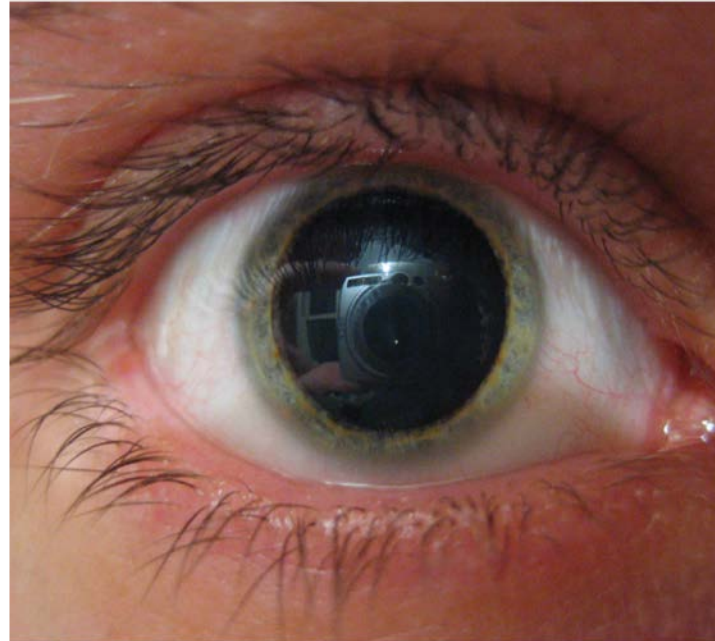
A person holding a baby



# Visual ability spectrum



**PERMANENT**  
A person who is blind



**TEMPORARY**  
A person with dilated eyes  
from an eye exam



**SITUATIONAL**  
A person driving and looking  
at a device

# Auditory ability spectrum



PERMANENT

A person who is hard of hearing



TEMPORARY

A person with an ear infection



SITUATIONAL

A person at a concert

# Accessibility improves usability

By making your website accessible, you are ensuring that all of your potential users, including people with disabilities, have a decent user experience and are able to easily access your information

[usability.gov/what-and-why/accessibility.htm](https://usability.gov/what-and-why/accessibility.htm)

# Captioning



We cultivate innovative faculty and student leaders



# Touch targets



Appropriate padding



Tiny touch target



Too small





# Color contrast

Weak Contrast  
Makes Things  
Invisible

Strong Contrast  
Makes Things  
Legible

Bad accessibility = bad usability

# Bad accessibility = bad usability

People Undergraduate Graduate Courses Certificates Alumni Giving Admin Contact Us

## 2018 RELI Summer Classes

Summer 2018 registration has begun! Online course offerings include RELI 283/ASIA 300: The Buddhist Tradition: India, Nepal, Tibet, taught by Professor Leve, and RELI 162: Catholicism Today: An Introduction to the Contemporary Catholic Church, taught by Professor Marienberg. Details below (click on each poster for a PDF):

**RELI 209: VARIETIES OF EARLY CHRISTIANITY**  
2018 Summer I (May 16-June 21, 2018)  
MTWR 3:00 – 5:00 PM Global Center 3024

Zlatko Pleše  
116 Carolina Hall [plese@email.unc.edu](mailto:plese@email.unc.edu)



**General Education Requirements:**  
Fulfills HS, NA, WB

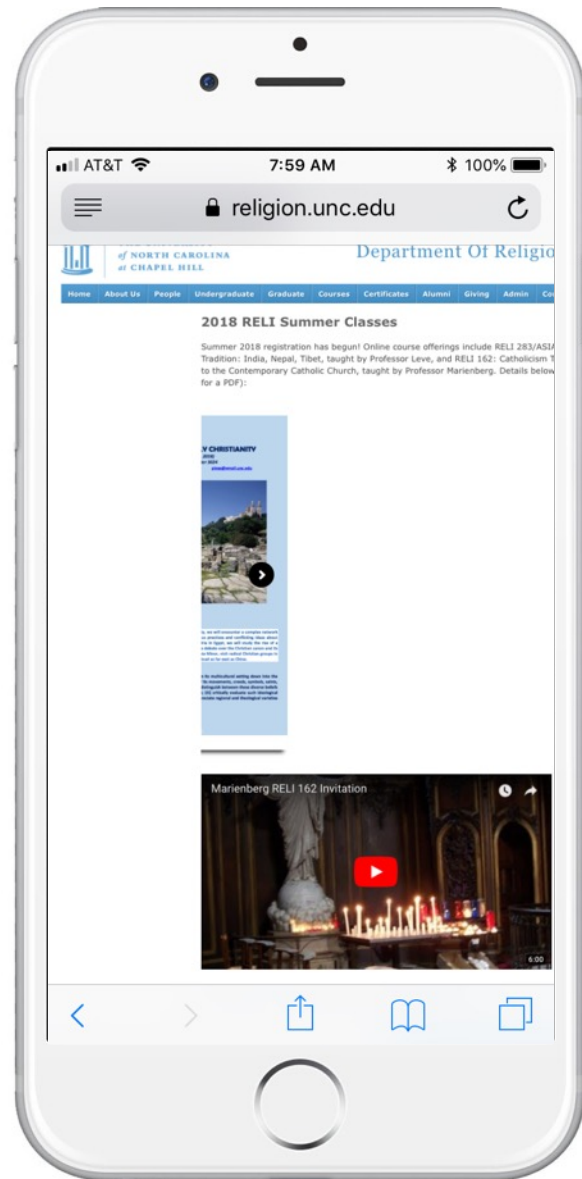
During our five-week journey through the world of early Christianity, we will encounter a complex network of Christian groups, individuals, and churches with diverse religious practices and conflicting ideas about orthodoxy, canon, and authority structures. On reaching Alexandria in Egypt, we will study the rise of a philosophical brand of Christianity. In Rome, we will take part in the debate over the Christian canon and its interpretation. We will witness the persecutions of Christians in Asia Minor, visit radical Christian groups in Africa, and travel with the Manichaean missionaries along the Silk Road as far east as China.

**COURSE OBJECTIVES:**  
The course covers over 400 years, from the rise of Christianity in its multicultural setting down into the beginning of the Middle Ages, and examines the rich diversity of its movements, creeds, symbols, saints, and sinners. By the end of this course, you should be able to: (i) distinguish between these diverse beliefs and practices; (ii) analyze primary texts in their cultural context; (iii) critically evaluate such ideological constructs as orthodoxy, heresy, and canon, and (iv) learn to appreciate regional and theological varieties of today's Christianity.

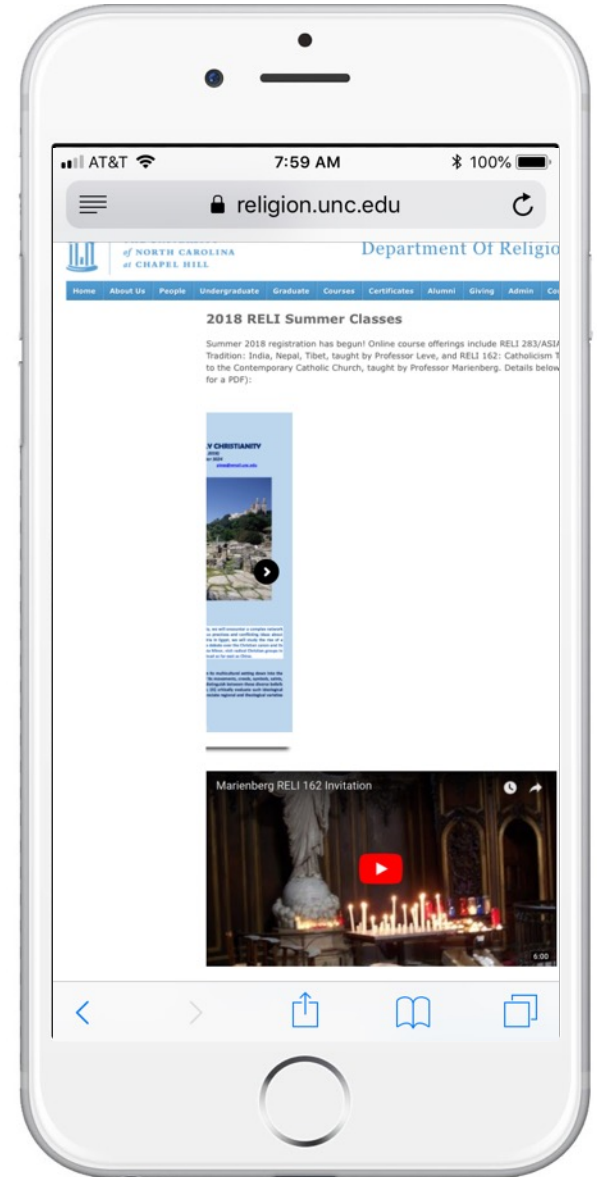
● ● ● ● ●

- Important information is stuck in a slider
- Important information is an image
- Poor color contrast

# Bad accessibility = bad usability



- Important information is stuck in a slider
- Important information is an image
- Poor color contrast
- Not Responsive!







G

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UNIVERSITY OF N.C.  
AT CHAPEL HILL

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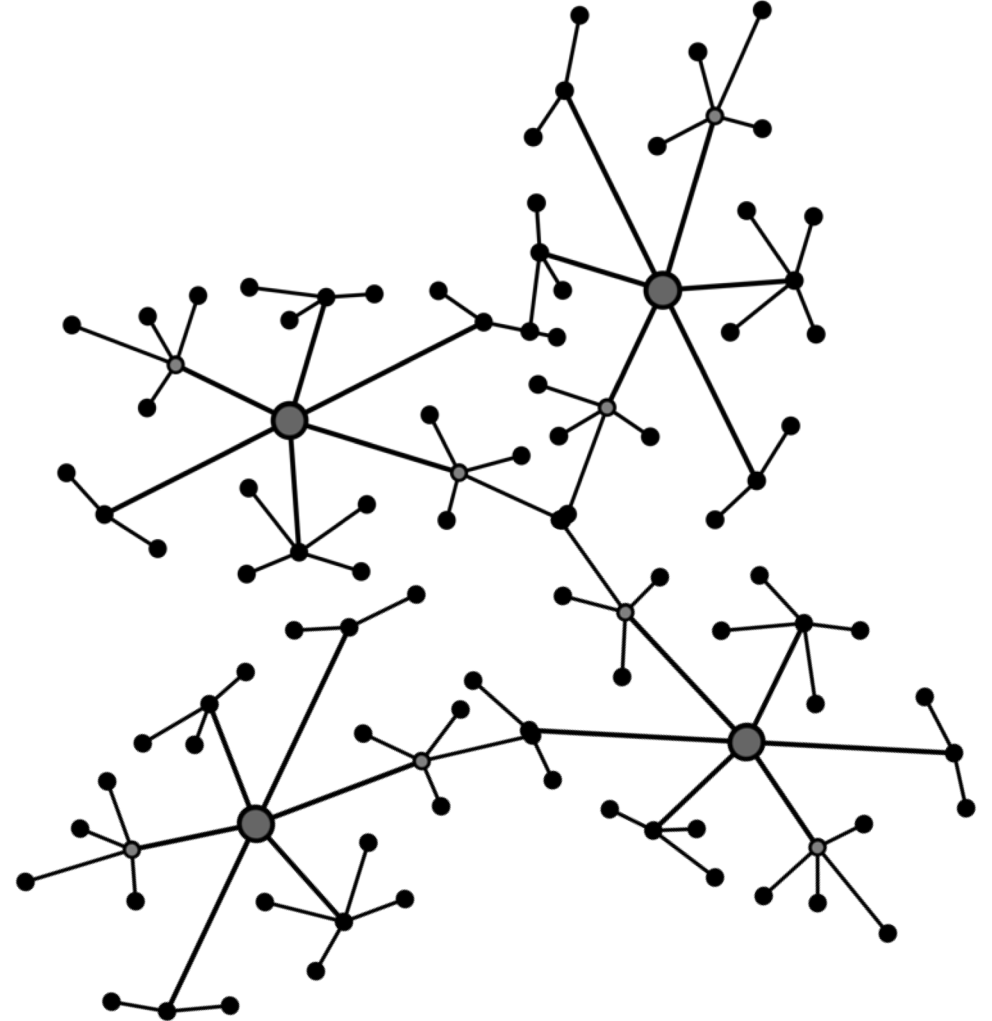
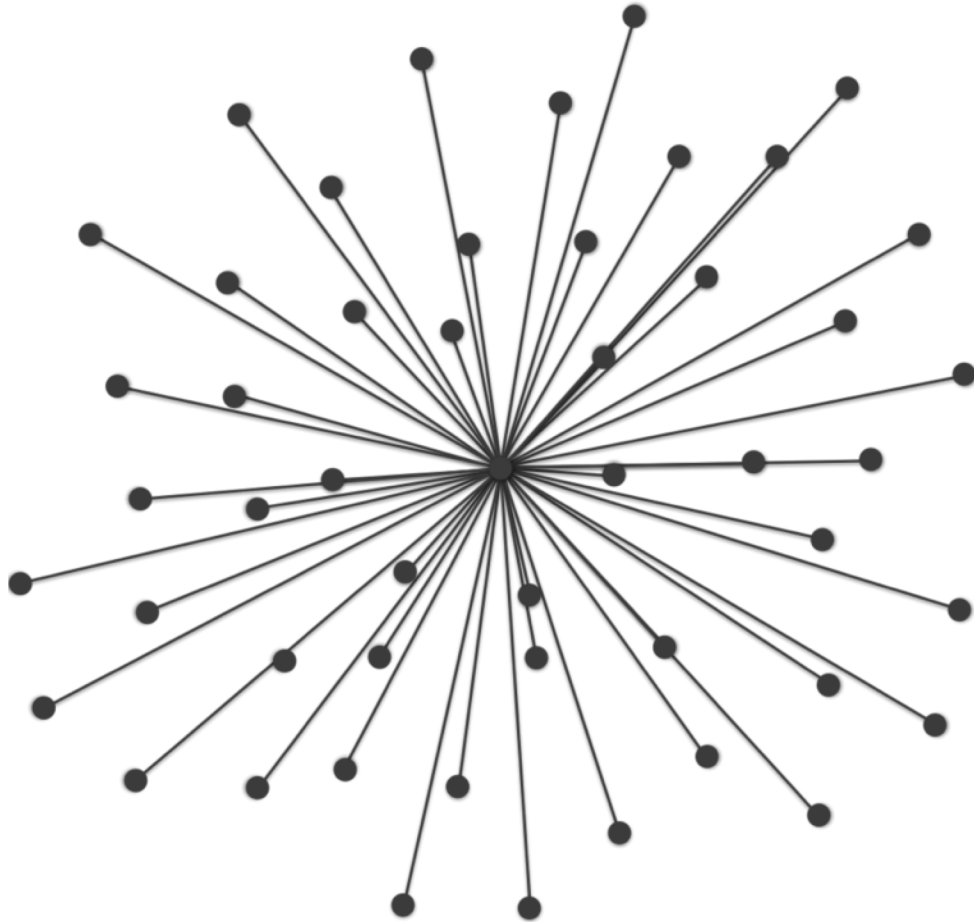
First state university  
to open its doors, 1795.  
Chartered in 1789 under  
the Constitution of 1776.

DIVISION OF ARCHIVES AND HISTORY

1973



# ITS – Digital Services is a centralized service



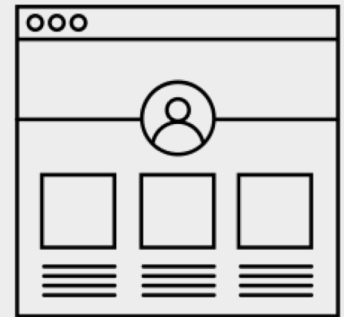
# What we do



18K+ Sites

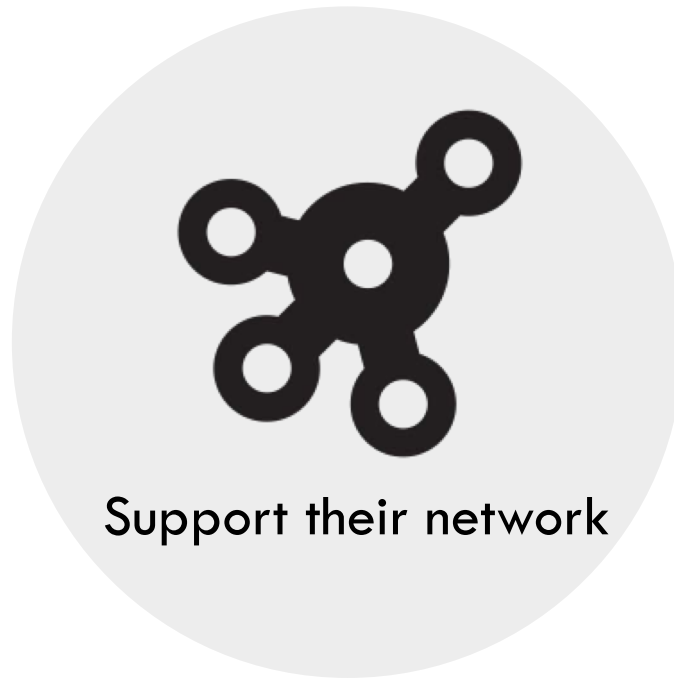


Support the network



Not the content

# Around campus







...the University  
is the wild west



# Eat your veggies approach to accessibility





# Digital Services' work

- Accessibility audit of ITS owned sites
- Began building our own awareness/skillset
- Consulting with groups on campus



# OCR Complaint

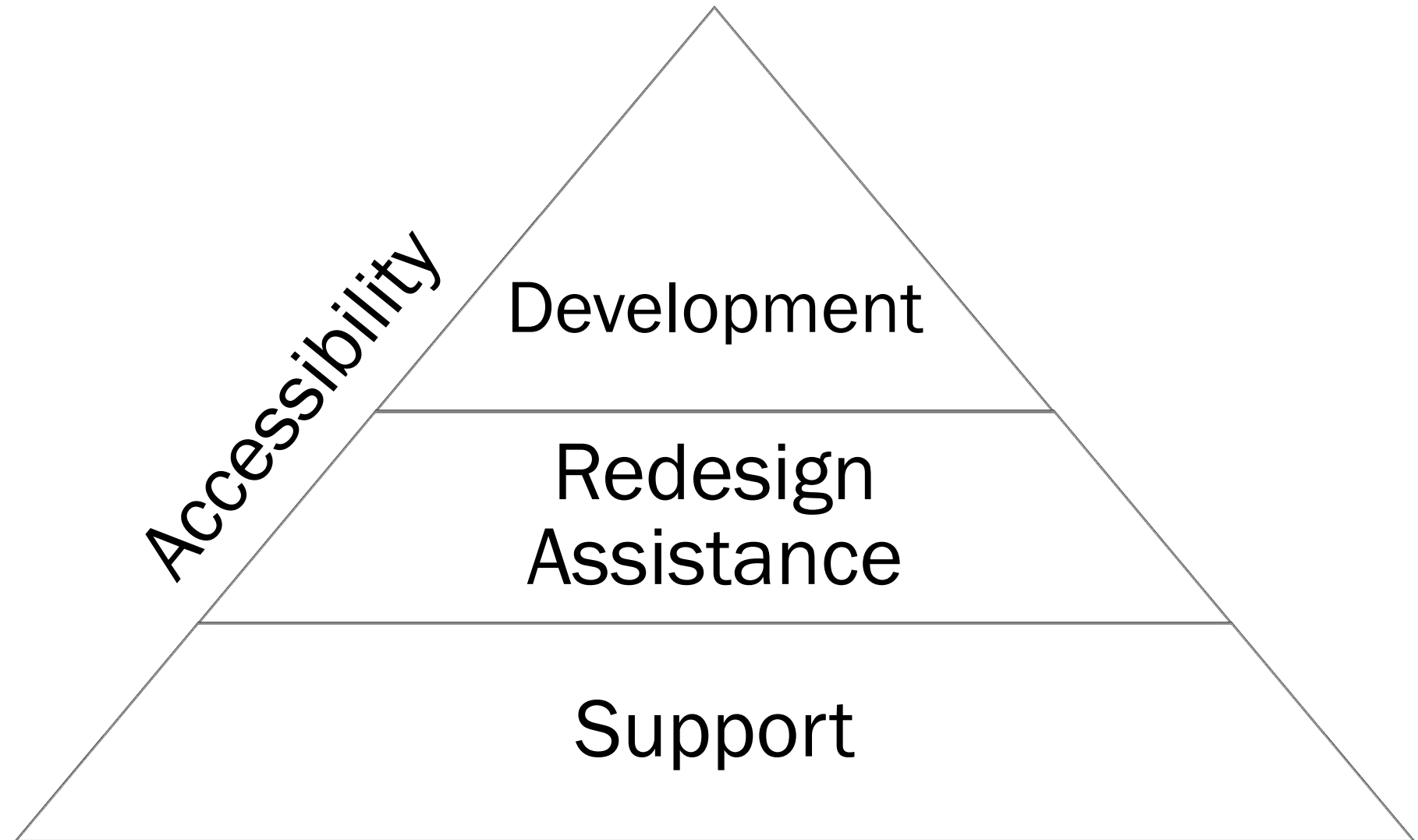


# Now

- Evangelizing to the community
- More consults with more groups



# Adding accessibility to the workflow



# Original Carolina Blue

## Color Contrast Checker

[Home](#) > [Resources](#) > Color Contrast Checker

### Foreground Color

#7BAFD4



Lightness



### Background Color

#FFFFFF



Lightness



Contrast Ratio

**2.35:1**

[permalink](#)

### Normal Text

WCAG AA: **Fail**

WCAG AAA: **Fail**

The five boxing wizards jump quickly.

### Large Text

WCAG AA: **Fail**

WCAG AAA: **Fail**

The five boxing wizards jump quickly.

### Explanation

# Updated color palette

## FOR ALL WEB APPLICATIONS:

In 2017, the University adopted a new policy for web accessibility. Follow these color guidelines to ensure your website meets WCAG 2.0 AA accessibility standards.\* For more information regarding accessibility, visit [access.web.unc.edu](https://access.web.unc.edu).



**Web Carolina Blue**

Hex #4B9CD3

RGB 75, 156, 211



**Link Blue**

Hex #007FAE

RGB 0, 127, 174



**Athletics Navy**

Hex #13294B

RGB 19, 41, 75



**Light Gray**

Hex #E1E1E1

RGB 225, 225, 225



**Dark Gray**

Hex #767676

RGB 118, 118, 118



**Black**

Hex #151515

RGB 21, 21, 21



# Accessibility audits

## Accessibility analysis report

01/19/18 Phil Daquila, ITS Digital Services

### ► unc.edu

**Violation:** Elements do not have sufficient color contrast.

**Issue description:** Ensures the contrast between foreground and background colors meets WCAG 2 AA contrast ratio thresholds for those with low vision or color blindness.

**Impact:** Serious. Low-contrast text is difficult or impossible for some users to read.

**Requirements:** 4.5:1 for text 14pt (19px) and smaller  
3:1 for text 18pt (24px) and larger, or 14pt (19px) bold and larger

### Please fix the following items:

DISCOVER NAVIGATE SEARCH

Element has insufficient color contrast of 3.00. Expected contrast ratio of 4.5:1.

Foreground color: #4b9cd3, background color: #ffffff, font size: 13.5pt (18px), font weight: normal.

**Solution:** Either darken background color or increase font size.

Visit the [GAA website](#) for (multiple occurrences of this style)

**Example page:** <https://unchome-prd.isis.unc.edu/alumni/>

Element has insufficient color contrast of 3.91. Expected contrast ratio of 4.5:1. Contrast requirement is in place even if link is underlined.

Foreground color: #3b7ca7, background color: #eeeeee, font size: 12pt (16px), font weight: normal.

**Solution:** Darken foreground color or lighten background color.

### FIXED

OPEN GALLERY

Element has insufficient color contrast of 3.00. Expected contrast ratio of 4.5:1.

Foreground color: #4b9cd3, background color: #ffffff, font size: 13.5pt (18px), font weight:

# Chrome tool

Responsive 1624 x 1366 42% Online

Elements Console Sources Audits 3

m.hyatt.com 4/30/2018, 7:51:42 AM

### Accessibility

These checks highlight opportunities to [improve the accessibility of your web app](#). Only a subset of accessibility issues can be automatically detected so manual testing is also encouraged.

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#### Elements Have Discernible Names

These are opportunities to improve the semantics of the controls in your application. This may enhance the experience for users of assistive technology, like a screen reader.

- ▶ Links do not have a discernible name

#### Color Contrast Is Satisfactory

These are opportunities to improve the legibility of your content.

- ▶ Background and foreground colors do not have a sufficient contrast ratio.

#### Meta Tags Used Properly

These are opportunities to improve the user experience of your site.

- ▶ [user-scalable="no"] is used in the <meta name="viewport"> element or the [maximum-scale] attribute is less than 5.

▶ 6 Passed Audits

▶ 26 Not Applicable Audits

Console What's New x Performance monitor Animations x

### Highlights from the Chrome 66 update

#### Pretty-printing in the Preview and Response tabs

The Preview tab now pretty-prints by default, and you can force pretty-printing in the Response tab via the new Format button.

#### Predefined HTML content in the DevTools

Accessibility from the start

Remediation is complicated.

Remediation is expensive.





"Accessibility is like a blueberry muffin—  
you can't push the berries in there afterward."

-- Cordelia McGee-Tubb



# THANK YOU!

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