

Accessibility as a First-Class Concern in Teaching GUIs and Software Engineering

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Accessibility should be a core topic in software development

Including accessibility is a **low-effort task** that can **improve software design skills**



Our Course Context

Info 343: Client-Side Web Development

- HTML, CSS, JavaScript, Web Frameworks (Angular, React)
- Required one-quarter course for our majors!



"New" Material: Perceivability

Provide textual equivalent to visual elements

```
<!-- `alt` to describe images -->  
  
  
<!-- ARIA attributes for other elements -->  
<div class="green-rect" aria-label="a green rectangle"></div>  
  
<button>  
  <span class="search-glyph" aria-hidden="true"></span>  
  Search  
</button>
```



"New" Material: Navigability

Use semantic tags (and ARIA landmarks)

HTML 5	ARIA Role
<code><header></code>	<code>role="banner"</code>
<code><nav></code>	<code>role="navigation"</code>
<code><main></code>	<code>role="main"</code>
<code><footer></code>	<code>role="contentinfo"</code>
<code><aside></code>	<code>role="complementary"</code>
<code><section></code>	<code>role="region" *</code>
<code><article></code>	<code>role="article" *</code>
<code>none</code>	<code>role="search"</code>
<code><form></code>	<code>role="form"</code>



Course Changes

Reinforced content that we included anyway!

- Change **one** lecture on accessibility concepts
 - Practice HTML tag and attribute syntax
 - Have students use a screen reader!
- Add **one** focused assignment
 - Adding HTML to follow W3C & Accessibility standards
 - **Can be graded automatically**



Supported CS Principles

- **Separation of Concerns**
 - HTML for *content* semantics, not *appearance*!
- **Working with Standards**
 - Following W3C and WAI-ARIA specifications





Works for Most GUI Frameworks!

- Example: Java Swing

(<http://docs.oracle.com/javase/tutorial/uiswing/misc/access.html>)

Method	Purpose
<code>getAccessibleContext().setAccessibleName(String)</code> <code>getAccessibleContext().setAccessibleDescription(String)</code> (on a <i>JComponent</i> or <i>Accessible</i> object)	Provide a name or description for an accessible object.
<code>void setToolTipText(String)</code> (in <i>JComponent</i>)	Set a component's tool tip. If you don't set the description, than many accessible contexts use the tool-tip text as the accessible description.
<code>void setLabelFor(Component)</code> (in <i>JLabel</i>)	Associate a label with a component. This tells assistive technologies that a label describes another component.
<code>void setDescription(String)</code> (in <i>ImageIcon</i>)	Provide a description for an image icon.

- Example: Android Development

(<https://developer.android.com/guide/topics/ui/accessibility/apps.html>)



Works for Many Courses!

- **Software Engineering**
 - A *non-functional requirement* for student projects
...that is testable!
- **Human-Computer Interaction**
 - A lens for considering navigation / Universal Design
- **Any Course!**
 - A way to emphasize **diversity** in software design



An accessibility focus improves teaching software development

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 Access Computing

The Alliance for Access to Computing Careers

<https://www.washington.edu/accesscomputing/>

