A close-up photograph of a spider web, showing the intricate spiral and radial patterns of the silk. The web is set against a dark, blurred background. A dark horizontal band runs across the center of the image, containing the text "Web testing" in a white, sans-serif font.

Web testing

What is web testing?

Testing web applications

Applications of which the client runs in a web browser

In this lecture on web testing

What to test

How to test it

What to test



- Security testing
- Load testing
- Functionality testing
 - **End-to-end testing**
 - **Unit testing**
- Performance testing (anything non-functional)
- User acceptance testing
- **Automated user interface testing**
- A/B testing
- Exploratory testing
- **Accessibility testing**

Tips

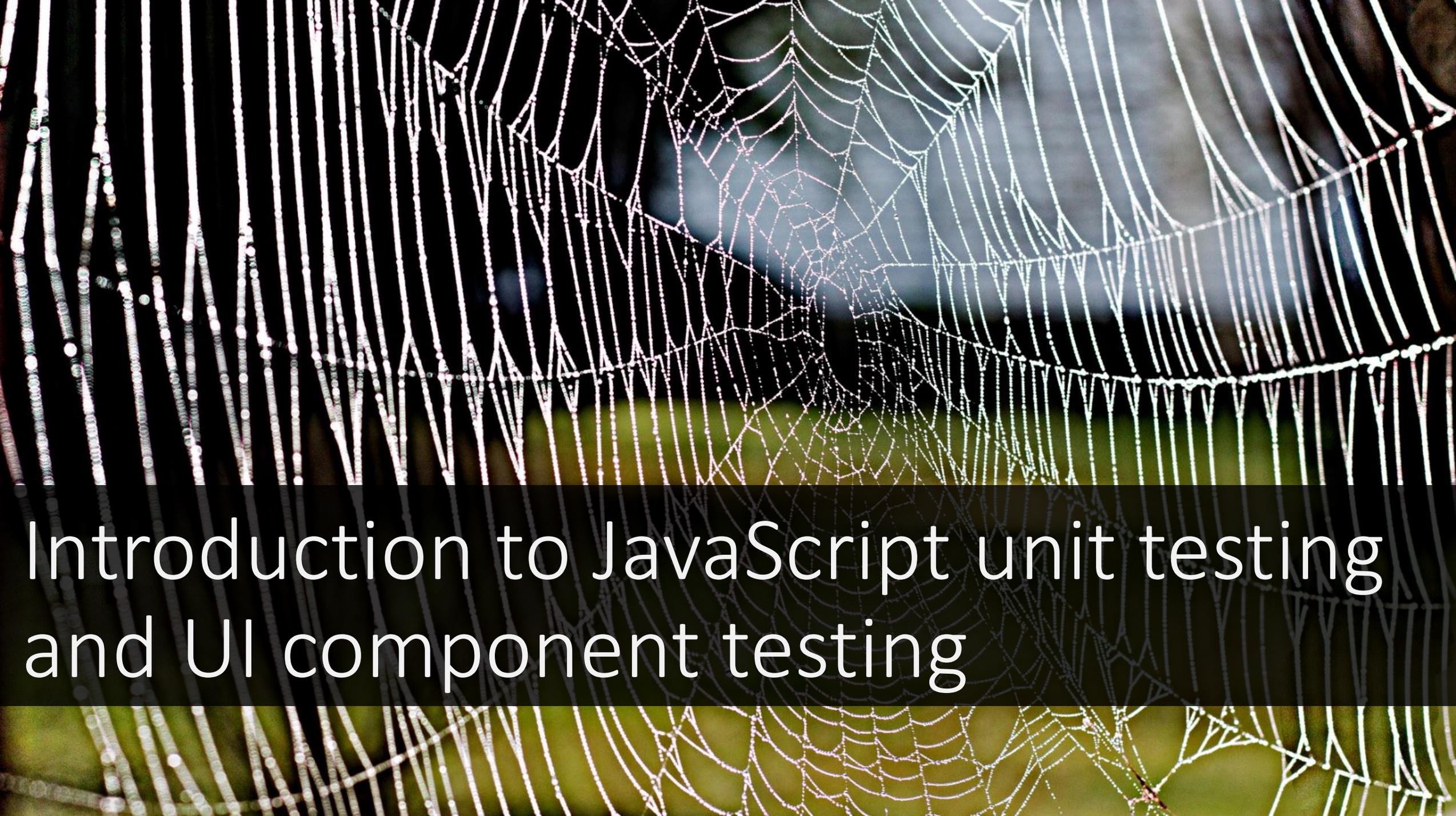
- Carefully consider the aforementioned types of tests
- Take all these tests into account when doing hour estimations

The remainder of this lecture

JavaScript unit testing and UI component testing

End-to-end testing

Accessibility testing



Introduction to JavaScript unit testing and UI component testing

Technologies used



JEST



Enzyme

 **WebStorm**

... but pick whatever
you like best!

Live coding: JavaScript unit tests

Pay attention to the following:

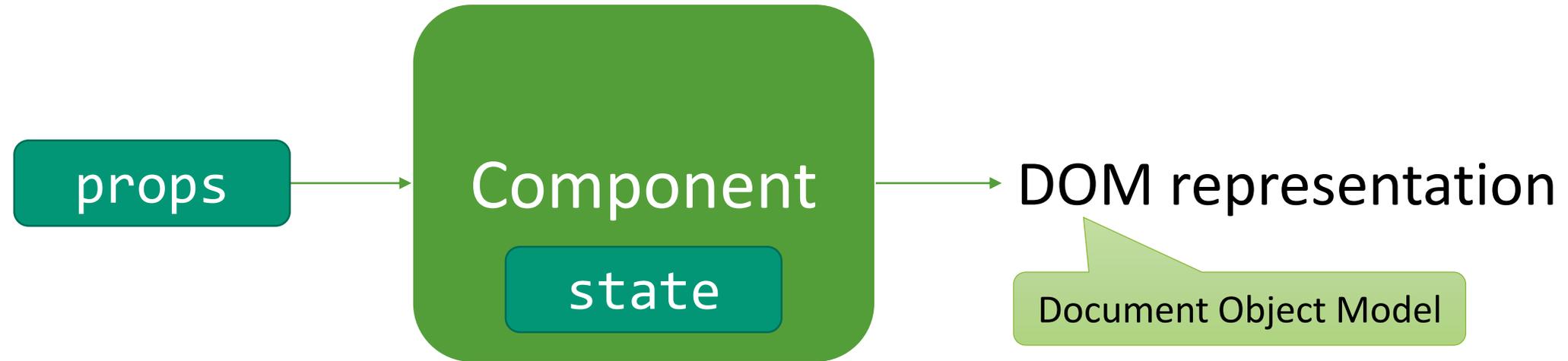
- How does this compare to your Java unit tests?
- How can you design your JavaScript for testability?



Tips

- Use a purely functional coding style
- Separate logic from UI
- Use modules to organise your code and to allow for easy mocking

React components



Example:

```
const TitleComponent = props => {  
  return (  
    <h1>{props.title}</h1>  
  )  
};
```

A light green callout box with a pointer to the JSX code contains the text 'JSX'.

Tips

- Create small, independent components
- Use component tests to do early UI testing
- Snapshot tests can save you a lot of work, but use them with care



End-to-end testing

Story time: testing at QDelft

Story time: testing at QDelft

Example of a manual “test script”:

#	Description	OK/NOK
1	Open the web application at http://localhost:3000	OK
2	Click the search box	OK
3	Type some text in the search box and check whether the results list is updated automatically	OK
4	Check whether the search results match the input	NOK

Automating end-to-end tests

Selenium

- Works as a “remote control” for your browsers.
- Can be used for automating any task (not just testing).
- Useful for cross-browser testing (with services like BrowserStack).

Cypress

- Integrates with your browser and is specifically targeted at end-to-end testing.

Demo: Cypress



Challenges when doing end-to-end testing

- Test data
- Finding elements on the page
- Waiting for results

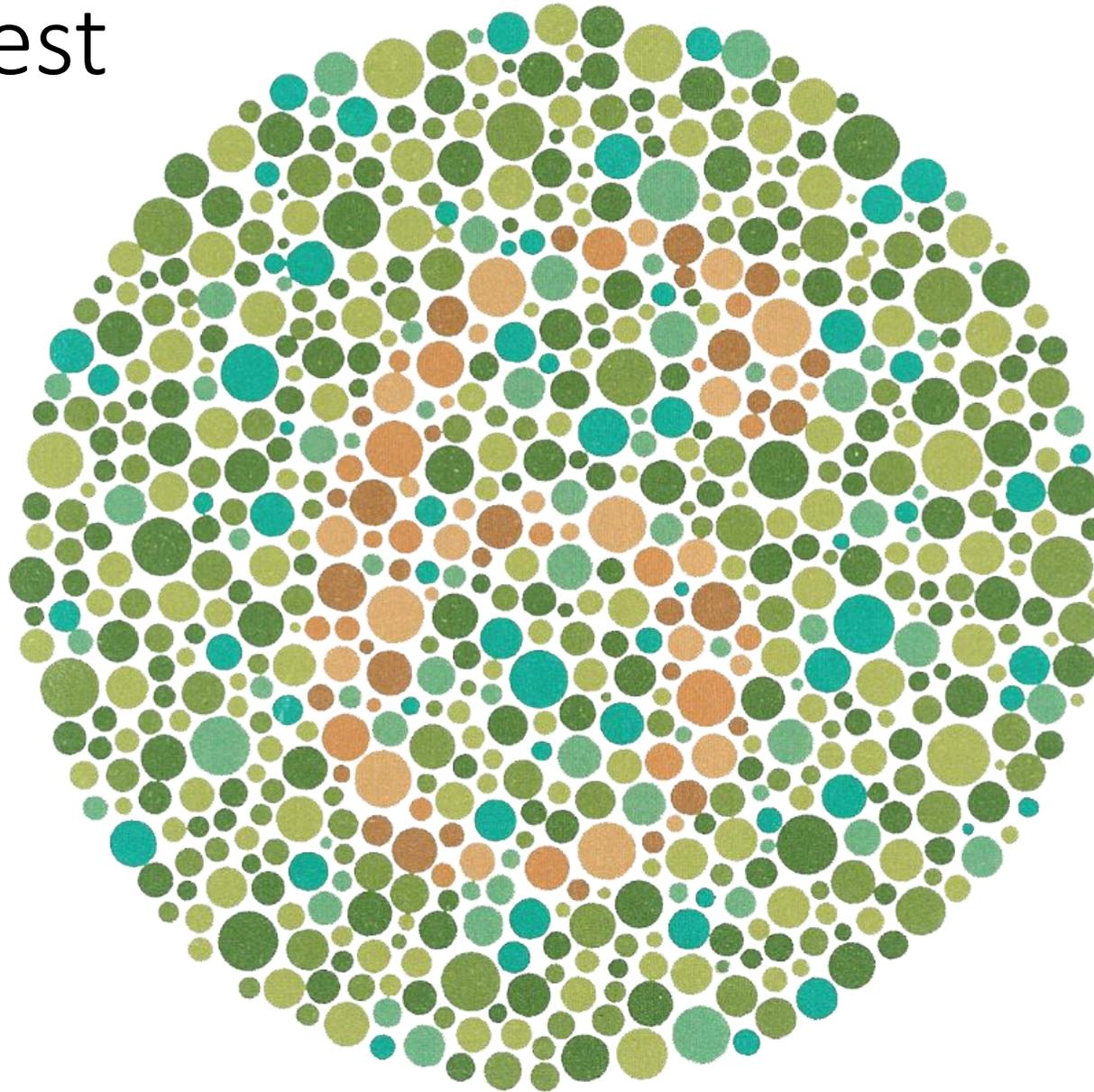


Accessibility testing

Accessibility

Make sure that anyone can use your web application, including people with disabilities.

Ishihara test



Example: “your indicated availability”

	Mon	Tue	Wed	Thu	Fri
09:00-11:00	●	●	●	●	●
11:00-13:00	●	●	●	●	●
13:00-15:00	●	●	●	●	●
15:00-17:00	●	●	●	●	●

When am I **not** available?

Example: “your indicated availability”

	Mon	Tue	Wed	Thu	Fri
09:00-11:00	●	●	●	●	●
11:00-13:00	●	●	●	●	●
13:00-15:00	●	●	●	●	●
15:00-17:00	●	●	●	●	●

When am I **not** available?

Example: “your indicated availability”

Don't do this

Mon	Tue	Wed	Thu	Fri
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●
●	●	●	●	●

Instead do this

Mon	Tue	Wed	Thu	Fri
✓	✓	✓	✓	✓
✓	✗	✓	✗	✓
✓	✓	✓	✓	✓
✓	✗	✓	✗	✓

Success Criterion 1.4.1 Use of Color

Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

— Web Content Accessibility Guidelines (WCAG) 2.1

Web Content Accessibility Guidelines (WCAG)

Content should be:

- Perceivable
- Operable
- Understandable
- Robust

<https://www.w3.org/TR/2018/REC-WCAG21-20180605/>

Accessibility: start early

If you only start thinking about accessibility during the testing phase, you are far too late.

Start with *inclusive design*.

Writing proper HTML prevents many accessibility issues.

Accessibility tools



aXe



WAVE



Tenon

Manual testing

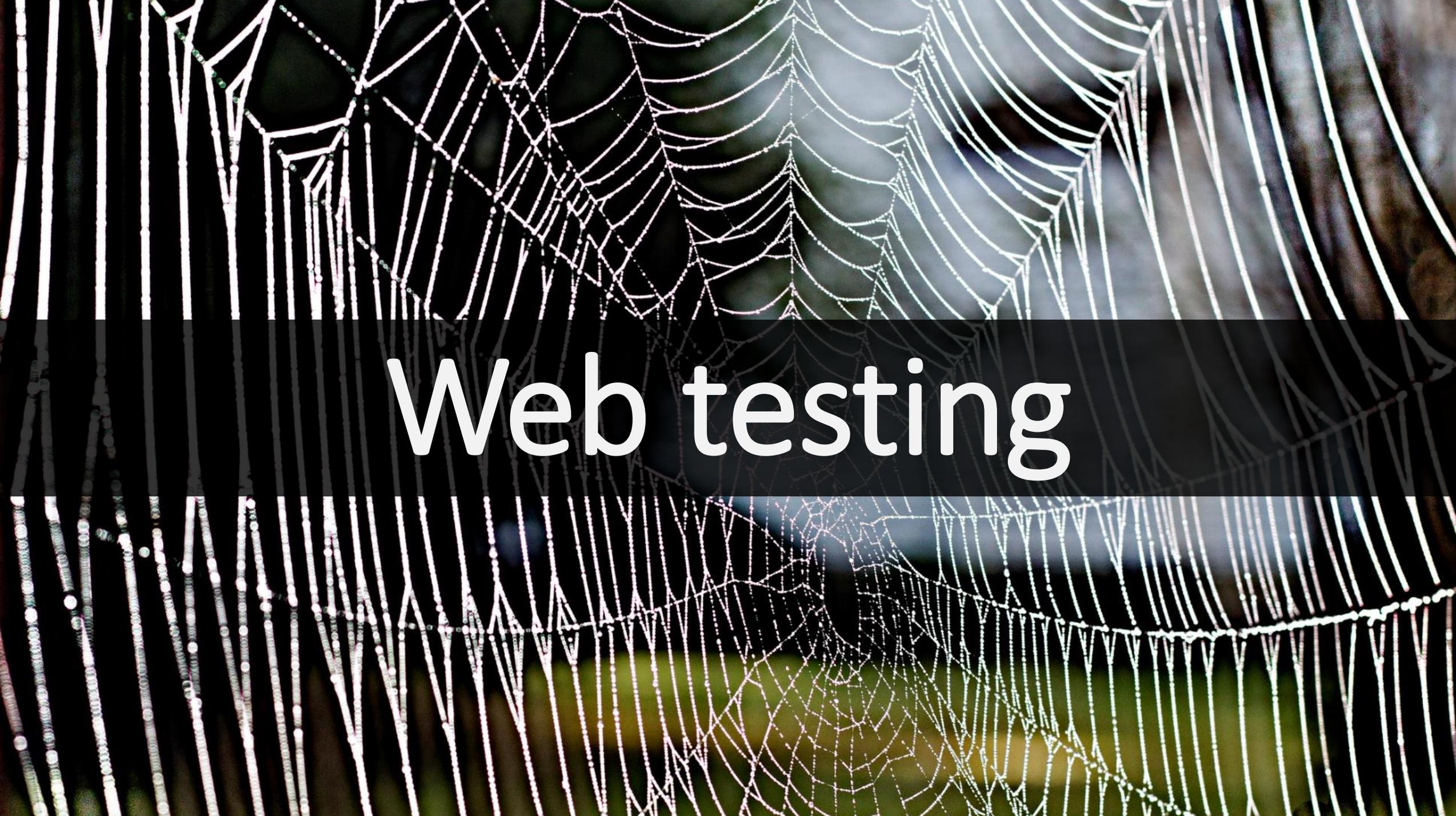
Essential for accessibility testing (tools miss >30% of issues).

- <https://accessibility.blog.gov.uk/2017/02/24/what-we-found-when-we-tested-tools-on-the-worlds-least-accessible-webpage/>

User interaction, logical flow of the application.

Thanks!

- All the code is available at <https://github.com/fm2003/emoji-search>

A close-up photograph of a spider web, showing the intricate spiral and radial patterns of the silk. The web is set against a dark, blurred background. A dark horizontal band runs across the center of the image, containing the text "Web testing" in a white, sans-serif font.

Web testing