Client-side web dev without Javascript

...with Scala.js!

http://tinyurl.com/_scalajs
Who am I?

- Li Haoyi
- Used to write Coffeescript at Dropbox web-infra
- Now working on Server Platform team
- Early contributor, users of Scala.js
- @li_haoyi on Twitter, @lihaoyi on Github
Plan

- Trends in Javascript-land (5min)
  - Where’s JS going?

- Introduction to Scala.js (10min)
  - Client-side development

- Isomorphic Scala.js (10min)
  - Client-Server Isomorphic code

- Why Scala.js? (5min)

- Q&A (5min)
Trends in Javascript-land

Where’s JS going?
Trends in Javascript-land: Immutability

- Easy caching
- Easy “Undo”
- Easier debugging
- No defensive copying

```javascript
var Immutable = require('immutable');
var map1 = Immutable.Map({
  a: 1,
  b: 2,
  c: 3
});
var map2 = map1.set('b', 50);
map1.get('b'); // 2
map2.get('b'); // 50
```
Trends in Javascript-land: Functional

- Return things instead of doing things

- Even when it’s tricky
  - e.g. promises

- Even when it requires perf hacks
  - e.g. virtual-dom
Trends in Javascript-land: Typechecked

- Catch bugs earlier!

- Enforced documentation
  - Cannot fall out of sync

- Make bad things look bad
  - e.g. any
Trends in Javascript-land: Compiled

- No more “just reload browser”
- Everyone uses build tools
- Provide tons and tons of value
Trends in Javascript-land: Isomorphic

- Don’t repeat yourself!

- Write code once, run anywhere
Trends in Javascript-land

- Immutable
- Functional
- Type-checked
- Compiled
- Isomorphic
var xhr = new XMLHttpRequest()
xhr.open("GET", "https://api.github.com/" + "users/lihaoyi/repos")
xhr.onload = function(e){
  if (xhr.status === 200)
    document.body.textContent = xhr.responseText
}
xhr.send()
let xhr = new XMLHttpRequest()
xhr.open("GET",
    "https://api.github.com/" +
    "users/lihaoyi/repos"
)
xhr.onload = (e) => {
    if (xhr.status === 200)
        document.body.textContent = xhr.responseText
}
xhr.send()
val xhr = new XMLHttpRequest()
xhr.open("GET",
"https://api.github.com/" +
"users/lihaoyi/repos"
)
xhr.onload = (e: Event) => {
  if (xhr.status === 200)
    document.body.textContent = xhr.responseText
}
xhr.send()
Introduction to Scala.js

Client-side Development
Scala.js

- Immutable
- Functional
- Type-checked
- Compiled
- Isomorphic
Scala.js: Scala to Javascript Compiler

- **Relatively quick**: 1-2s warm turnaround

- **Acceptable size**: small apps start at ~70kb, grow to 100s of kb pre-gzip

- **Efficient Code**: ~1-2x slower than “raw” Javascript
Javascript ES6 vs Scala.js

```javascript
let xhr = new XMLHttpRequest()
xhr.open("GET",
  "https://api.github.com/"+
  "users/lihaoyi/repos"
)
xhr.onload = (e) => {
  if (xhr.status === 200)
    document.body.textContent = xhr.responseText
}
xhr.send()
```

```scala
val xhr = new XMLHttpRequest()
xhr.open("GET",
  "https://api.github.com/"+
  "users/lihaoyi/repos"
)
xhr.onload = (e: Event) => {
  if (xhr.status === 200)
    document.body.textContent = xhr.responseText
}
xhr.send()
```
Type-checked by default

```scala
var paragraph = document.body
console.log(paragraph.children.length)
```

```
val paragraph = document.body
console.log(paragraph.children.length)
```

Cannot resolve symbol `children`

```
ScalaJSExample.scala:12: value children is not a member of org.
scalajs.dom.raw.Element
```

```
console.log(paragraph.children.length)
```

Compilation failed

```
Uncaught TypeError: Cannot read property 'length' of undefined
(anonymous function) @ index-fastopt.html:22
```
Outstanding editor support

```scala
def doThing(target: dom.Node) = {
  target.child
}
```
Live Demo

Client Application

https://github.com/lihaoyi/workbench-example-app
Scala.js is like Javascript but...

- Immutable & Functional by default
- Type-checked by default
- Outstanding editor support
- Isomorphic/Universal
- Broad Ecosystem
- Production Ready
Isomorphic Scala.js

Client-Server Isomorphic code
Live Demo

Client-Server Application

https://github.com/lihaoyi/workbench-example-app
Scala.js is like Javascript but...

- Immutable & Functional by default
- Type-checked by default++
- Outstanding editor support++
- Isomorphic/Universal++
- Broad Ecosystem
- Production Ready
Broad Ecosystem

Javascript Libraries
- Scala.js DOM
- Scala.js jQuery
- Scala.js React
- Scala.js Angular
- … more

Isomorphic Scala Libraries
- Scalatags
- uPickle
- Scalaz
- Scala-Async
- … more
Production Ready

- Ray Tracer
- 2D Platform Game
- Todo MVC

Coming from JS/Coffee/TypeScript, I think Scala.js is an absolute game changer for us. And as more and more Scala libraries get ported over to Scala.js, I believe this is just the start.

Binh Nguyen
Director of Engineering / Anduin Transactions, Inc.

The Scala.js experience was great! Thanks to the compiler and better IDE support, I was immensely more productive writing Scala for the browser than I am with plain JS and, say, Angular.

Clint Gilbert
Harvard Medical School
Why Scala.js?
Scala.js is like Javascript but...

- Immutable & Functional by default
- Type-checked by default
- Outstanding editor support
- Isomorphic/Universal
- Broad Ecosystem
- Production Ready
Questions?

www.scala-js.org