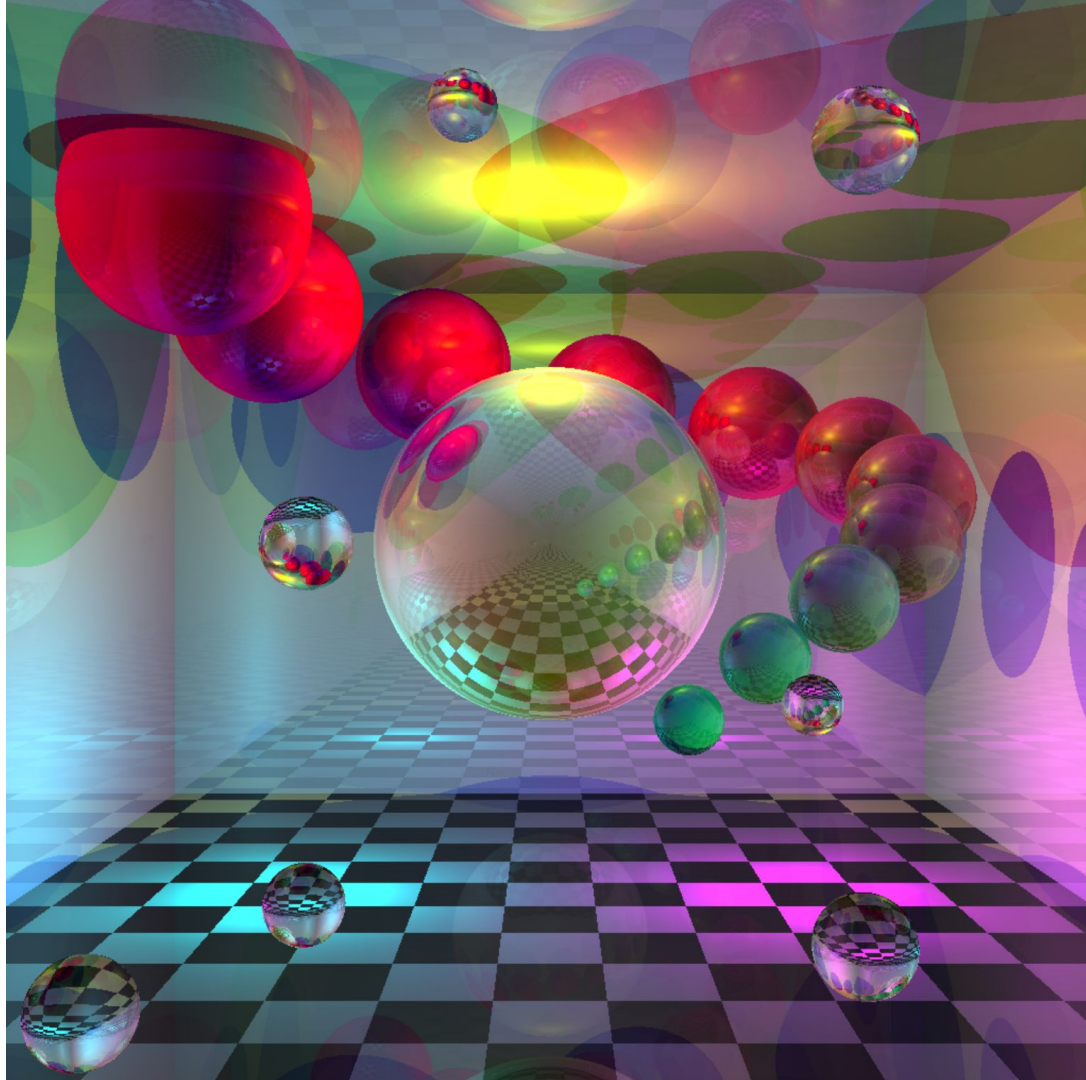


# Client-side web dev without Javascript

...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?

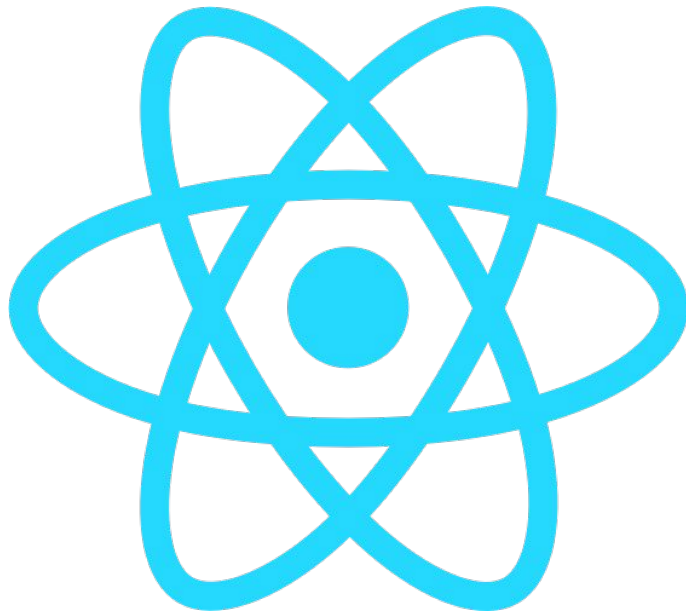
# Trends in Javascript-land: Immutability

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

```
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



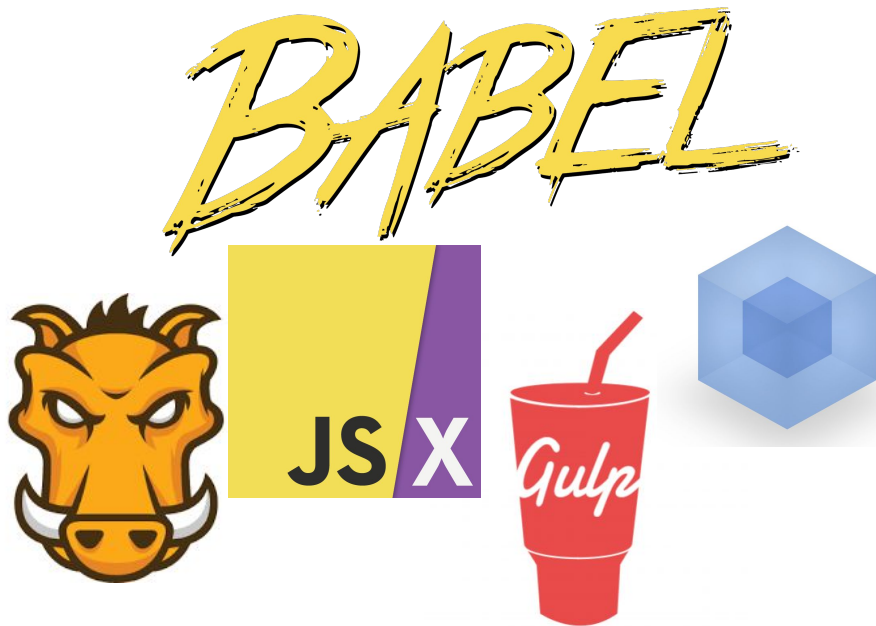
# Trends in Javascript-land: Typechecked

- Catch bugs earlier!
- Enforced documentation
  - Cannot fall out of sync
- Make bad things look bad
  - e.g. **any**



# Trends in Javascript-land: Compiled

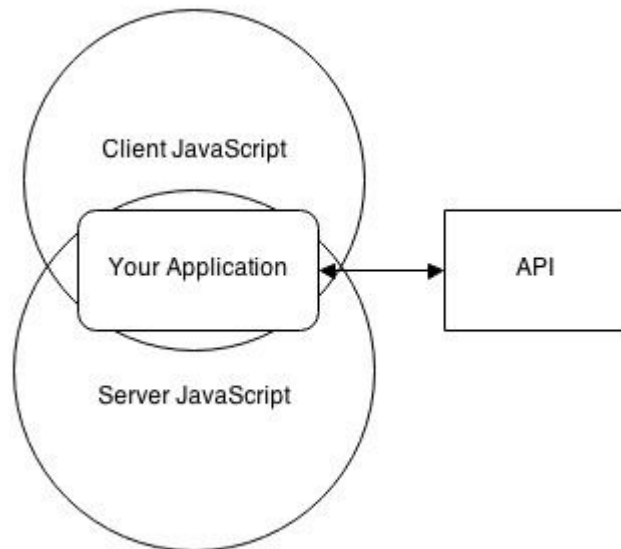
- No more “just reload browser”
- Everyone uses build tools
- Provide tons and tons of value





# Trends in Javascript-land: Isomorphic

- Don't repeat yourself!
- Write code once, run anywhere
- 



# Trends in Javascript-land

- Immutable
- Functional
- Type-checked
- Compiled
- Isomorphic

# Javascript

```
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()
```

# Javascript ES6

```
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.js

```
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

```
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()
```

# Type-checked by default

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

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

Cannot resolve symbol childrren

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

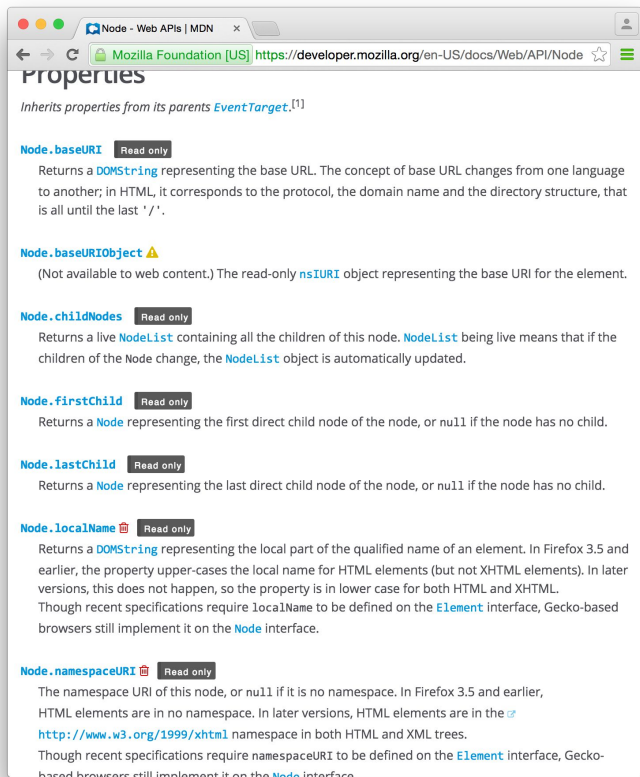
```
console.log(paragraph.childrren.length)
```

^

✖ ▼ Uncaught TypeError: Cannot read property 'length' of undefined  
(anonymous function) @ [index-fastopt.html:22](#)

Compilation failed

# Outstanding editor support



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

childNodes	NodeList
appendChild(newChild: Node)	Node
firstChild	Node
lastChild	Node
removeChild(oldChild: Node)	Node
replaceChild(newChild: Node, oldChild: Node)	Node
hasChildNodes()	Boolean

Press ^. to choose the selected (or first) suggestion and insert a dot afterwards >>> π

## Documentation for childNodes

SBT: org.scala-js:scalajs-dom\_sjs0.6\_2.11...

[org.scalajs.dom.raw.Node](#)

**def childNodes:** [NodeList](#)

Returns a live `NodeList` containing all the children of this node. `NodeList` being live means that if the children of the `Node` change, the `NodeList` object is automatically updated. MDN

# 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++
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- 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](http://www.scala-js.org)

