Elm in Production

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WebAppConf </>

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prima.it

Agenda

- How I got to Elm

- What makes it unique

- Migrating an app to Elm

Why Elm?

Javascript in a nutshell

same mistakes

same mistakes

same mistakes

same mistakes

same mistakes

`undefined`

same mistakes

same mistakes

`undefined`

same mistakes

> Insanity: doing the same thing over and over again and expecting different results.
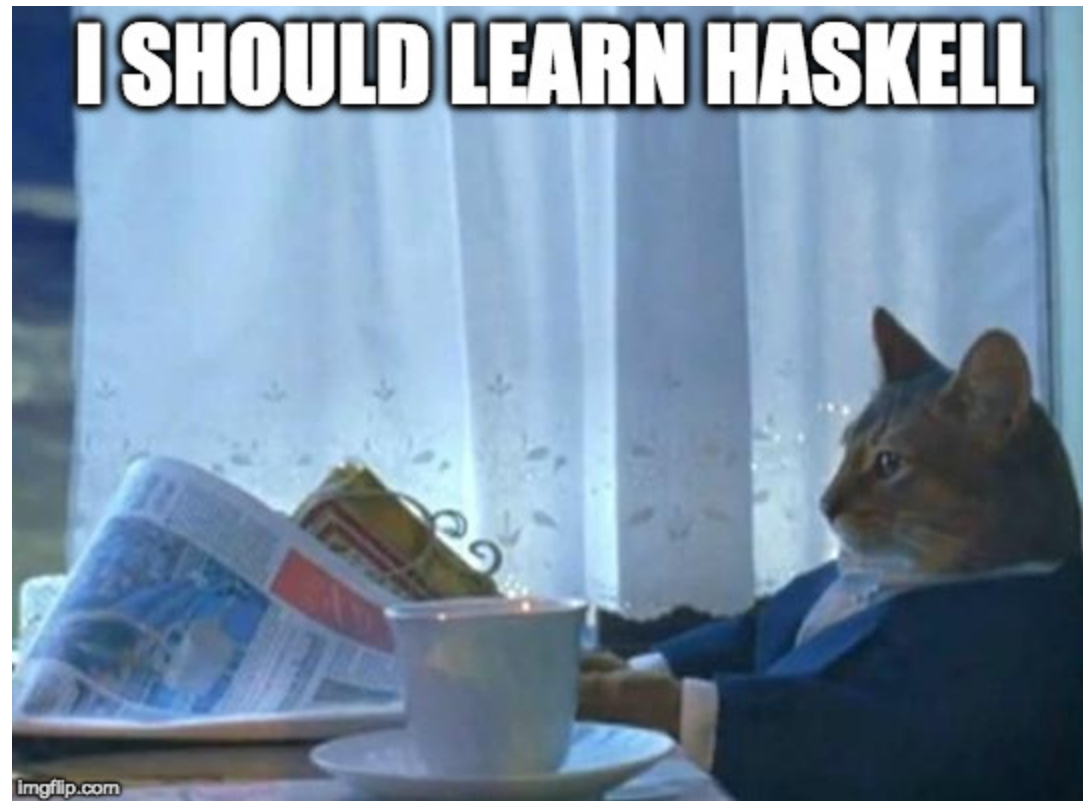
Einstein
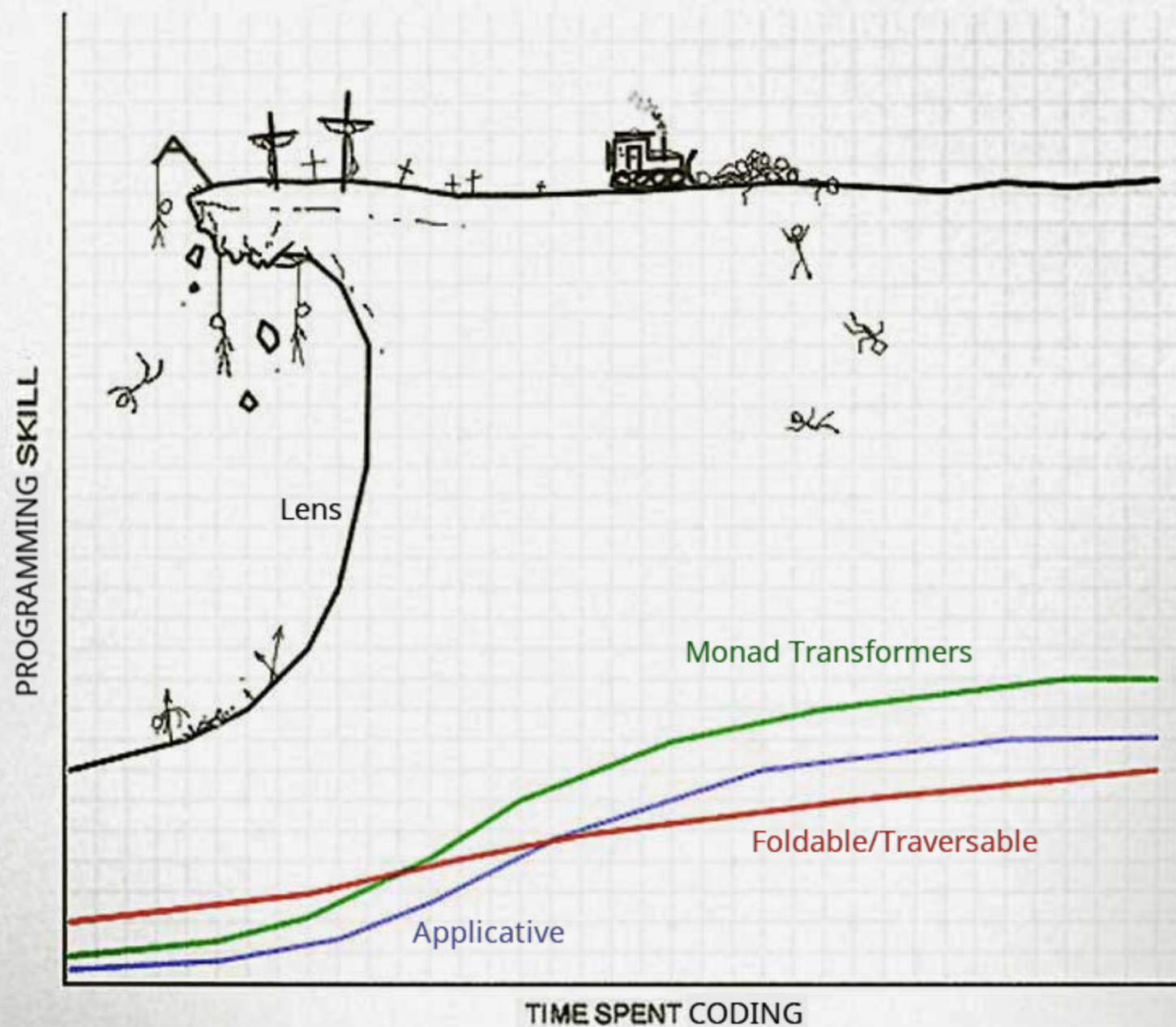
Functional Programming

+

Static typing

So... Haskell?

LEARNING CURVES OF POPULAR HASKELL CONCEPTS
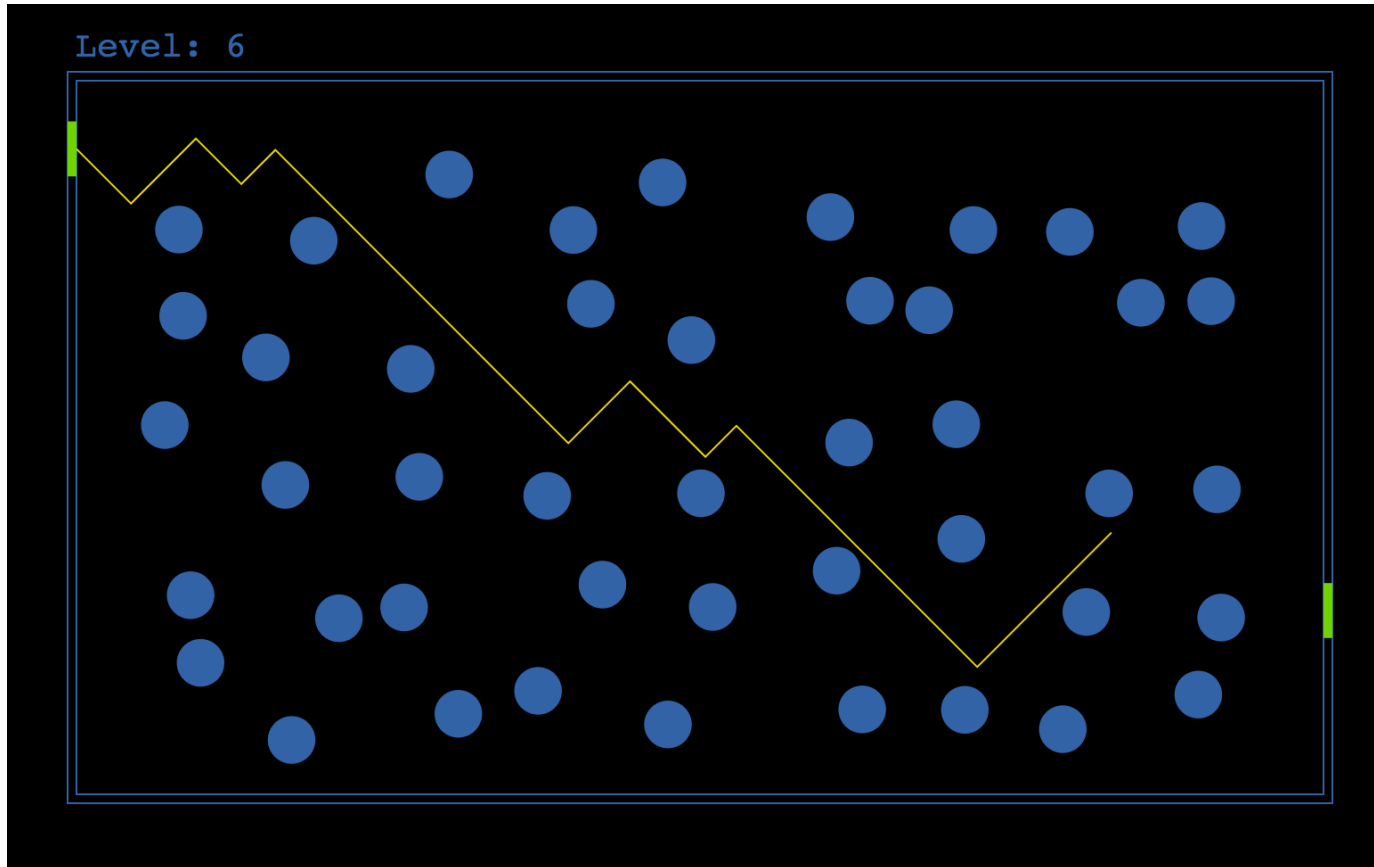
PROGRAMMING SKILL

Lens

Monad Transformers

Foldable/Traversable

Applicative

TIME SPENT CODING

elm

A delightful language for reliable webapps.

Started coding little games

Also https://runelm.io/

Real World Apps?

Hacker News Clone

- Routing

- Fetch data from GraphQL endpoint

- Non trivial UI state

https://elm-hn.surge.sh

Elm HN new | show | ask | jobs

1. **Principles for C programming** (drewdevault.com)
   102 points **Sir_Cmpwn** about 4 hours ago | 77 comments

2. **Beautiful Racket v1.0** (beautifulracket.com)
   334 points **Curiositry** about 9 hours ago | 30 comments

3. **Scrolling on the web: A primer** (windows.com)
   19 points **thmslee** about 2 hours ago | 2 comments

4. **Uber Driver Tip-Hustling Schemes** (boardingarea.com)
   269 points **prostoalex** about 9 hours ago | 376 comments

5. **Tesla to raise 1B** (tesla.com)
   417 points **loourr** about 12 hours ago | 252 comments

6. **The eigenvector of "Why we moved from language X to language Y"** (erikbern.com)
   119 points **platz** about 5 hours ago | 52 comments

7. **A star orbiting a black hole at 1 percent the speed of light** (sciencealert.com)
   111 points **curtis** about 6 hours ago | 40 comments

8. **3 Women Blinded by Unproven Stem Cell Treatments** (npr.org)
   57 points **daegloe** about 5 hours ago | 30 comments

9. **Reverse Culture Shock** (state.gov)
   190 points **jscholes** about 10 hours ago | 120 comments

10. **Practical Color Theory for People Who Code** (github.io)
    228 points **donnemartin** about 11 hours ago | 31 comments

11. **The Assembler Developer's Kit** (plantation-productions.com)
    23 points **mcbits** about 3 hours ago | discuss

12. **Information Avoidance: How People Select Their Own Reality** (cmu.edu)
    78 points **richardboegli** about 8 hours ago | 17 comments

Let's Talk about Elm!

- Common myths

- The Elm Architecture (TEA)

Common Myths

Common Myth #1 - FP

Myth: Functional Programming == `map().reduce()`

Truth: Functional Programming is about abstractions!

Common Myth #2 - Tests

Myth: Huge and complex Test suite == Lack of errors

> Writing unit tests is reinventing functional programming in non-functional languages

http://noss.github.io/2009/02/25/writing-unit-tests-is-reinventing-functional-programming-in-non-functional-languages.html

Testing is washing the dishes.

Automatic tests are a dishwasher.

Types are proof that your dishes are not even dirty.

https://twitter.com/runarorama/status/929754554111004672

Common Myth #3 - Types

Myth: Static Typing == Java

Truth: You can write Elm code without ever writing a type signature (not a great idea though).

The type system in Elm is much more powerful and expressive.

> The static typing debate is silly.
>
> Instead the question must be, **what can we prove about our programs before we run them & what is the cost?**

https://twitter.com/jdegoes/status/924035236035530752

No Runtime Errors. Ever.

Breaking News

Elm does not have `null` or `undefined`

🎉 🎉 🎉

In case you don't know

> I call it my billion-dollar mistake. It was the invention of the null reference in 1965.

Tony Hoare

Well, unless... 😏

```elm
-- You can force Elm to crash!
-- In case you miss JS from time to time...
Debug.crash "LOL runtime errors!" ()
```
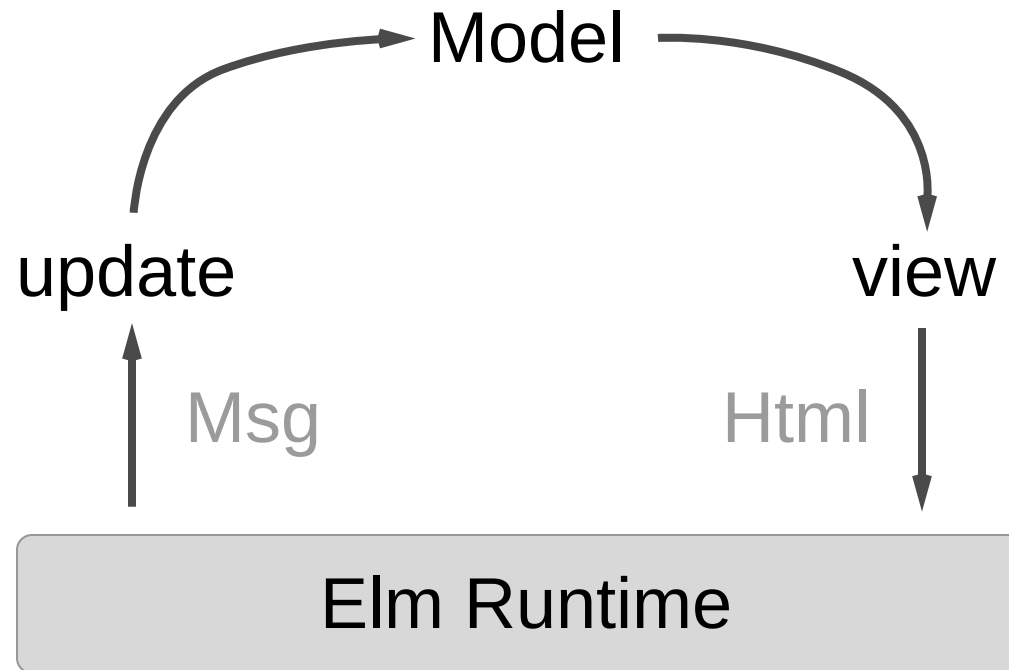
The Elm Architecture

reactjs/redux

> Redux evolves the ideas of Flux, but avoids its complexity by **taking cues from Elm**.

Elm Architecture

Model

update   view

Msg   Html

Elm Runtime

All apps are written the same way.

Migrating an Angular app to Elm

Rewrite one piece at a time.

> I noticed that everyone who successfully introduces Elm at work tells the same story.
>
> **They introduce Elm gradually into an existing JS project**. This process works because it minimizes risk.

Evan Czaplicki (Author of Elm)

Our Master plan

- Modify current app as little as possible

- Start serving the new Elm app at a specific route

In practice

- Elixir backend served the correct app depending on route

- Elm app would serve requests to `/documents`

- Angular app would serve all other requests

Elm is ready for production use, today.

The Elm compiler is fantastic and super stable.

Ecosystem

http://package.elm-lang.org/

Use `ports` for everything that's not available as a native package.

Elm is great for teams.

- The Elm Architecture

- `elm-format`

Unconventional development model

- Single person working on the Elm compiler, full time

- Not very open to contribution

- Elm releases take a while, focus on doing things right

- It's done when it's done

Is Elm the solution?

FP and Static Typing are the solution.

Alternatives

- Typescript (with `fp-ts`)

- Purescript

- ReasonML

- Fable (F#)

Join The FP Revolution

#fp on italiajs.slack.com

Thanks!

Send me your runtime errors on Twitter: @_alpacaaa