Hello!

My name is Teodor Lunaas Heggelund

Teaching kids to code

With Elm

At Oslo Elm Day 2019

Outline

- *Part 1.* Why teach kids code.
- *Part 2.* Our hero learns Elm.
  - Elm is Legos with magic bricks
  - The magic tools of our Elm hero
  - The challenges on the hero's journey
- *Part 3.* Conclusions.

Part 1. Why teach kids code

How I came to think that this is important

The Oslo Code Club Elm Course!

The Oslo Code Club Elm Course!

- 10 lessons
- 10 weeks
- Kids ages twelve to sixteen
- Some experience with Scratch and Python
- At the Unversity of Oslo, Blindern
- Thanks to Erik Aasmundrud, Alexander Perry and Tjerand Silde for help starting up.

Part 2. Our hero learns Elm

What does a kid learning Elm look like?

2.1

Elm is legos with magic bricks

2.2

The magic tools of our Elm hero

Ellie and Try Elm

Enable vision and change without interruption

The compiler

Shields us from damage

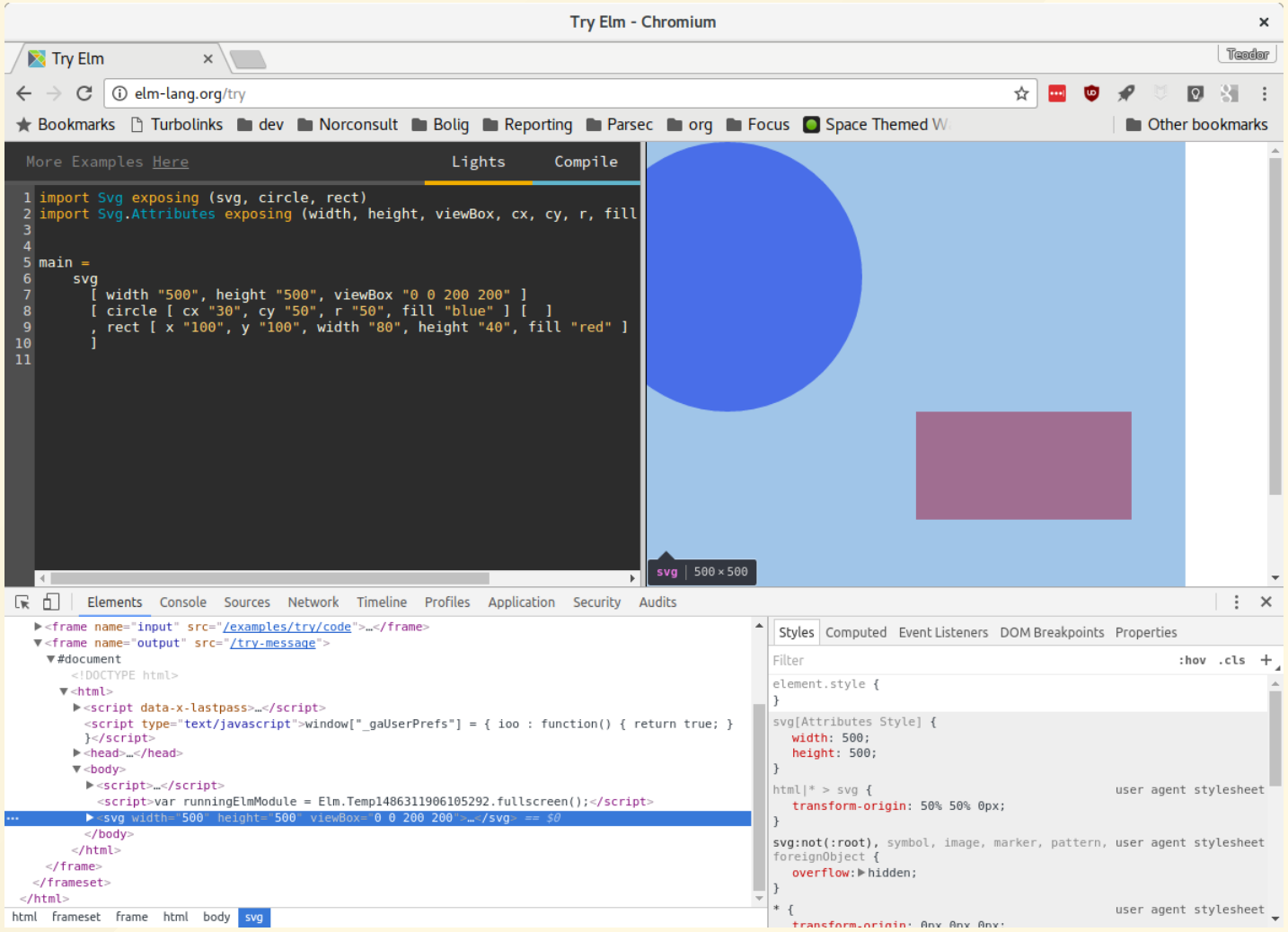
The browser

Lets us share our creation

2.3

Challenges on our hero's journey

Drawing with SVG: painting



Drawing with SVG: understanding coordinates?

```
import Svg exposing (svg, circle, rect)
import Svg.Attributes exposing
    (width, height, viewBox
    , cx, cy, r, fill, x, y, width, height)


main =
    svg
      [ width "500", height "500", viewBox "0 0 200 200" ]
      [ circle [ cx "30", cy "50"
               , r "50", fill "blue" ] [ ] ]
```

Drawing with SVG: understanding coordinates

Visualize!

```
(0,0) ---- (100, 0) ---- (200, 0) --- x
  |
(0, 100)   (100, 100)    (200, 100)
  |
(0, 200)   (100, 200)    (200, 200)
  |
  |
  y
```

Challenge: facing one huge main

> I'm drowning in brackets and indentation!

Challenge: one huge main

- Abstraction is hard

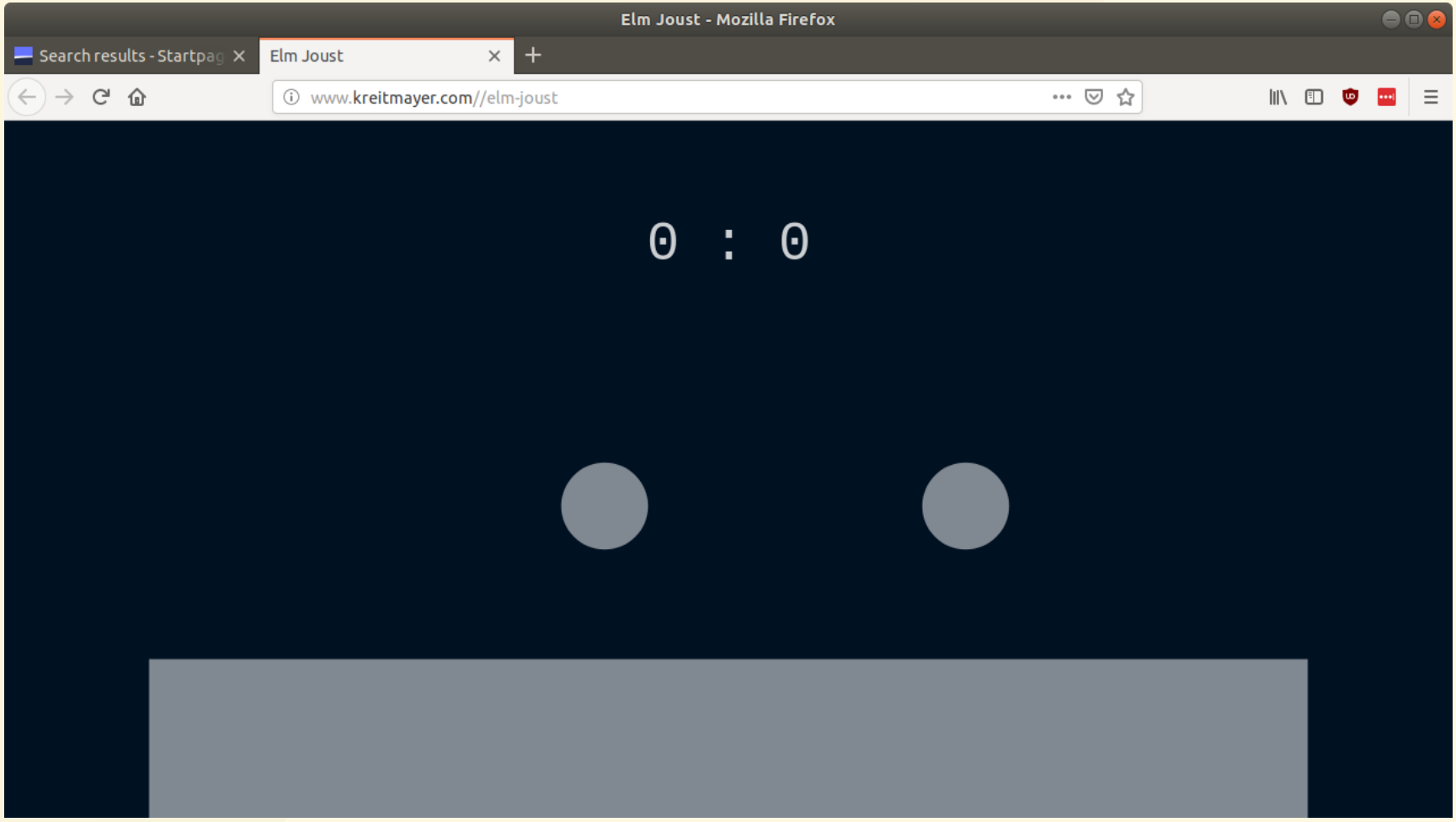
Challenge: one huge main

- Abstraction is hard
- Abstraction is ***hard***.

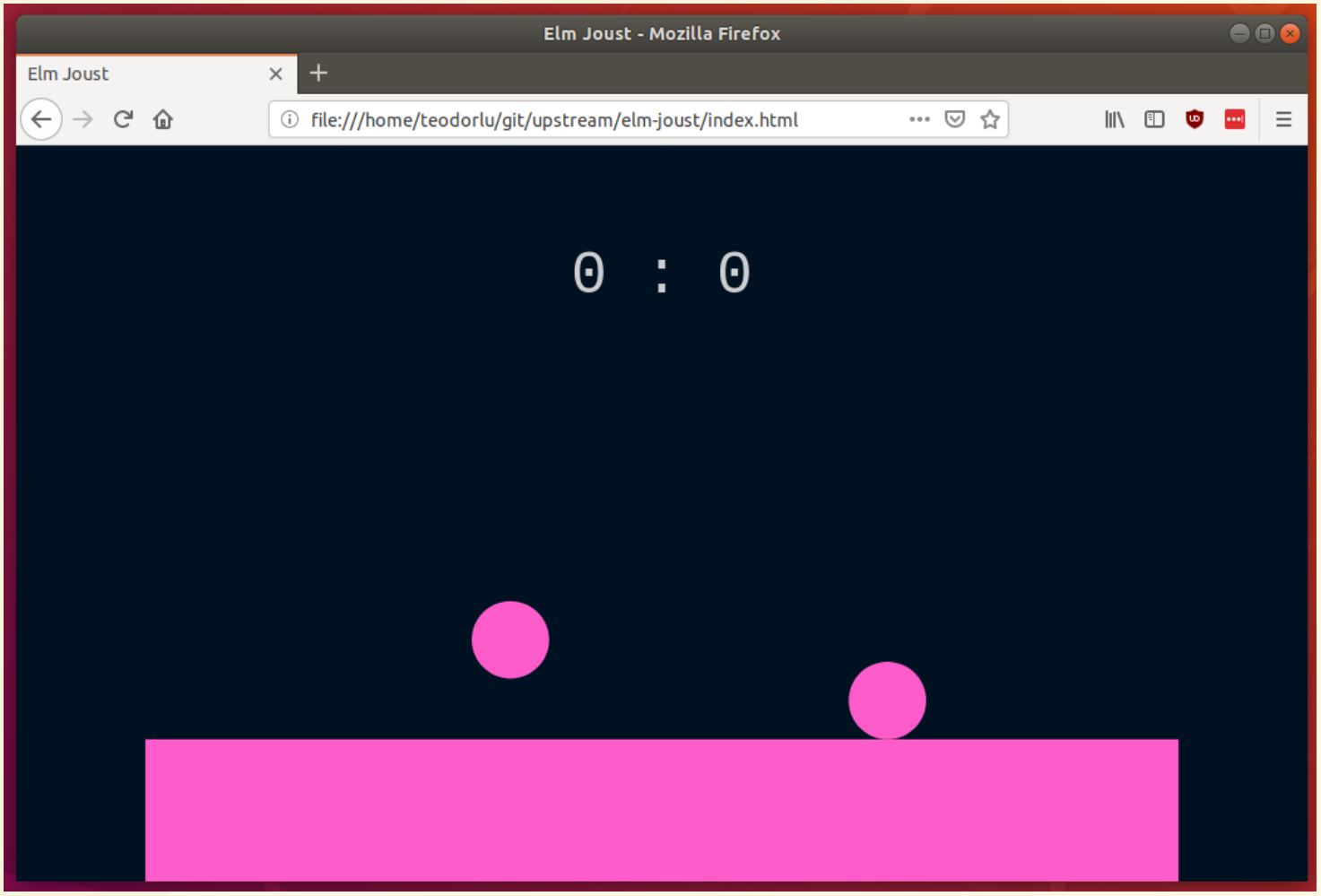
Challenge: one huge main

- Abstraction is hard
- Abstraction is ***hard***.
- Show, don't tell.
  - Create good guides
  - Show good examples

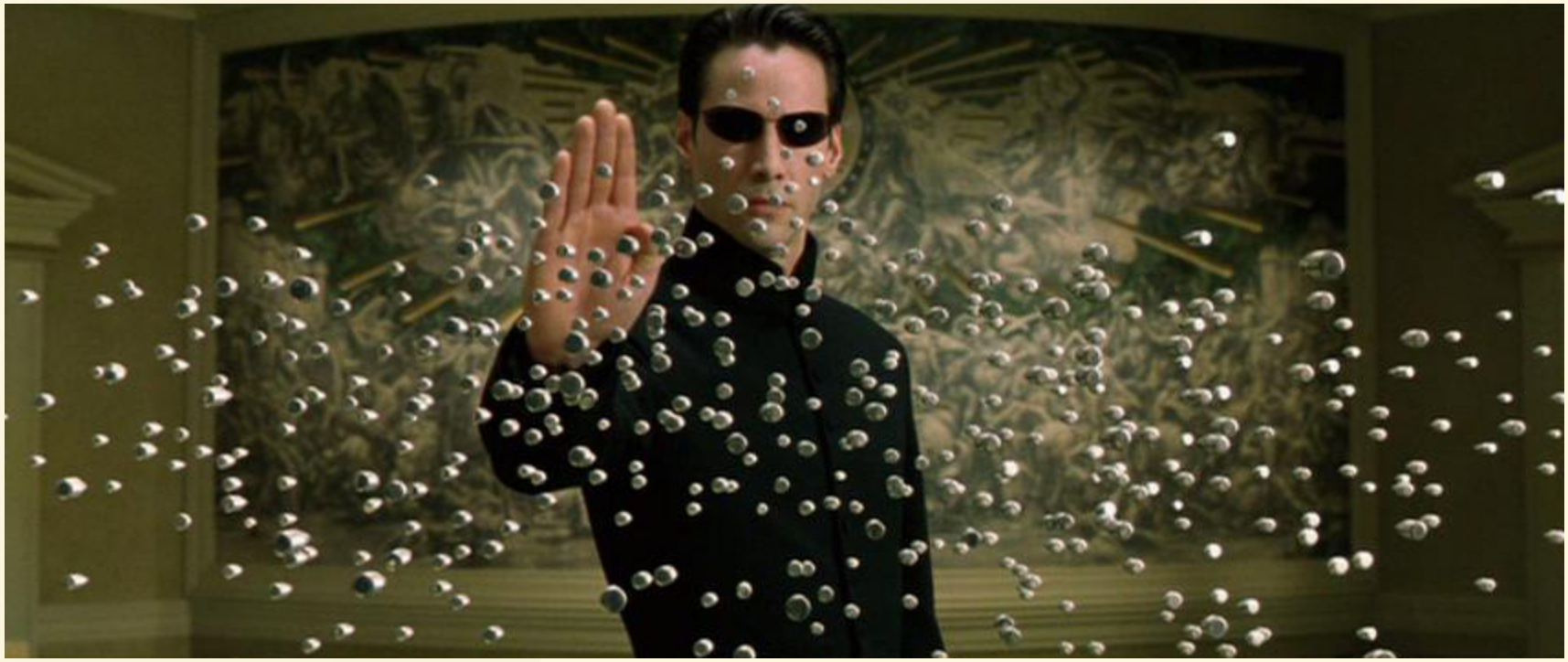
Elm Joust: exploring some real code



Elm Joust: a new visual appeal



Elm Joust: changing the rules



Neo also likes changing the rules

Part 3. Conclusions and the way forward

What did we learn?

Functional programming isn't that hard.

Kids don't fear it!

Too many moving parts may get you stuck

I just couldn't introduce the same amount of fun per lesson with JavaScript.

Enable others to make magic!

- *Make solid ground for others!*
- *Make it possible to change!*

... and the pieces you make may come into life in someone else's hands.

Teach Kids Code makes it simple to volunteer

Visit kidsakoder.no for more information!

References

- Bret Victor's *Learnable Programming* and other material
- Jean-Paul Sartre and Simone de Beauvoir's philosophical ground for turning statics and dynamics into magic
  - Philosophize This #106 is a nice resource
- My own musings on static-dynamic interaction

Find these slides at

www.teodorheggelund.com/static/teaching-kids-elm.pdf

Thank you!

- To you for listening.
- The Elm community for making Elm great!
- Teach Kids Code in Norway for doing important work
- Pure Logic AS for letting me spend work time on this, and doing important work in civil engineering

Thank you!

- The organizers of Oslo Elm Day for making this conference happen
- Erik, Perry and Tjerand for helping build the Code Clob Elm course
- Lisa for making me lots of coffee

Questions?

If there's any time!

Otherwise, just come talk to me.