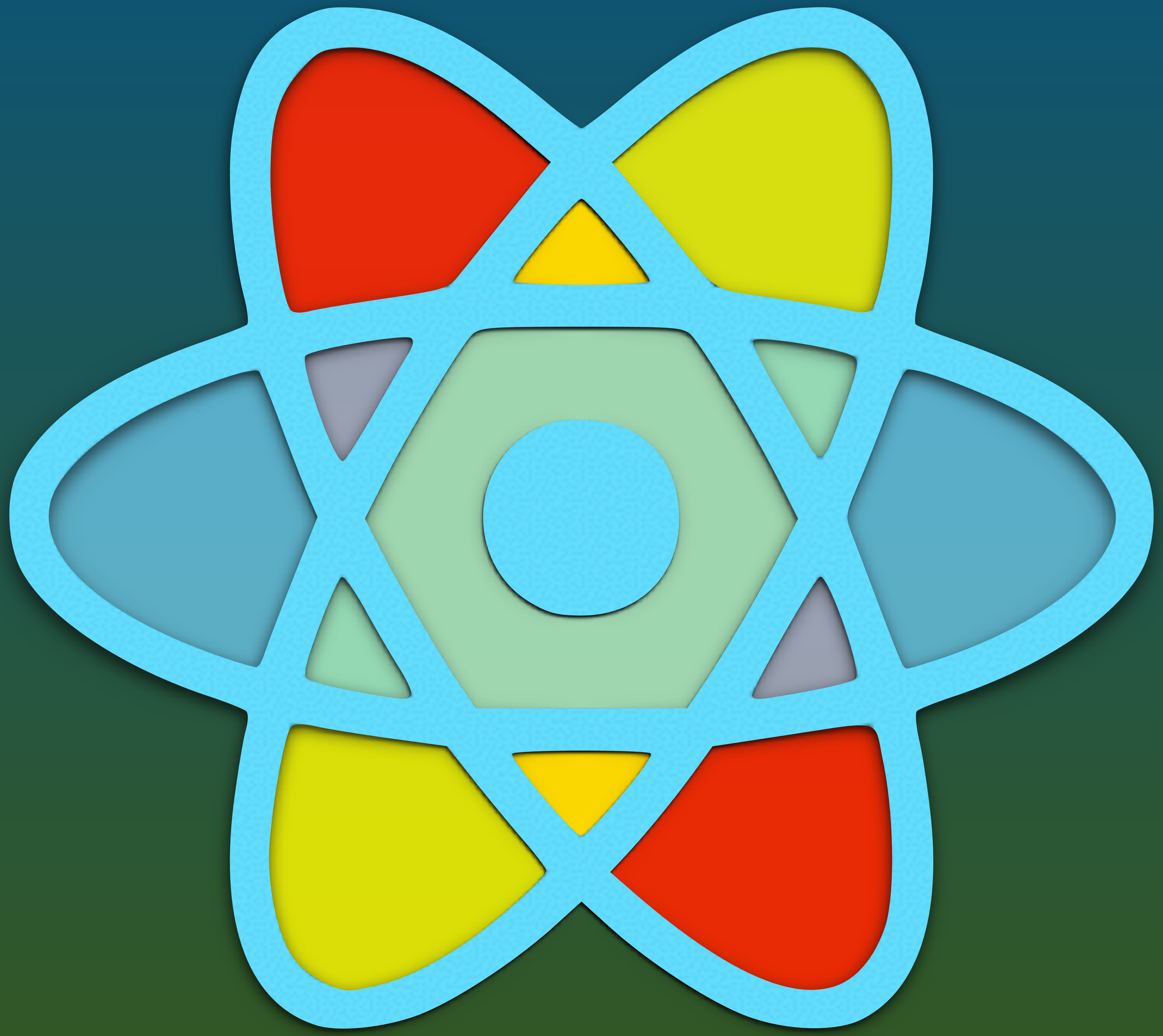
TypeScript, PureScript and Elm for functional JavaScript

Prof. D. König

What they have in common

Transpiling to JavaScript

What they have in common



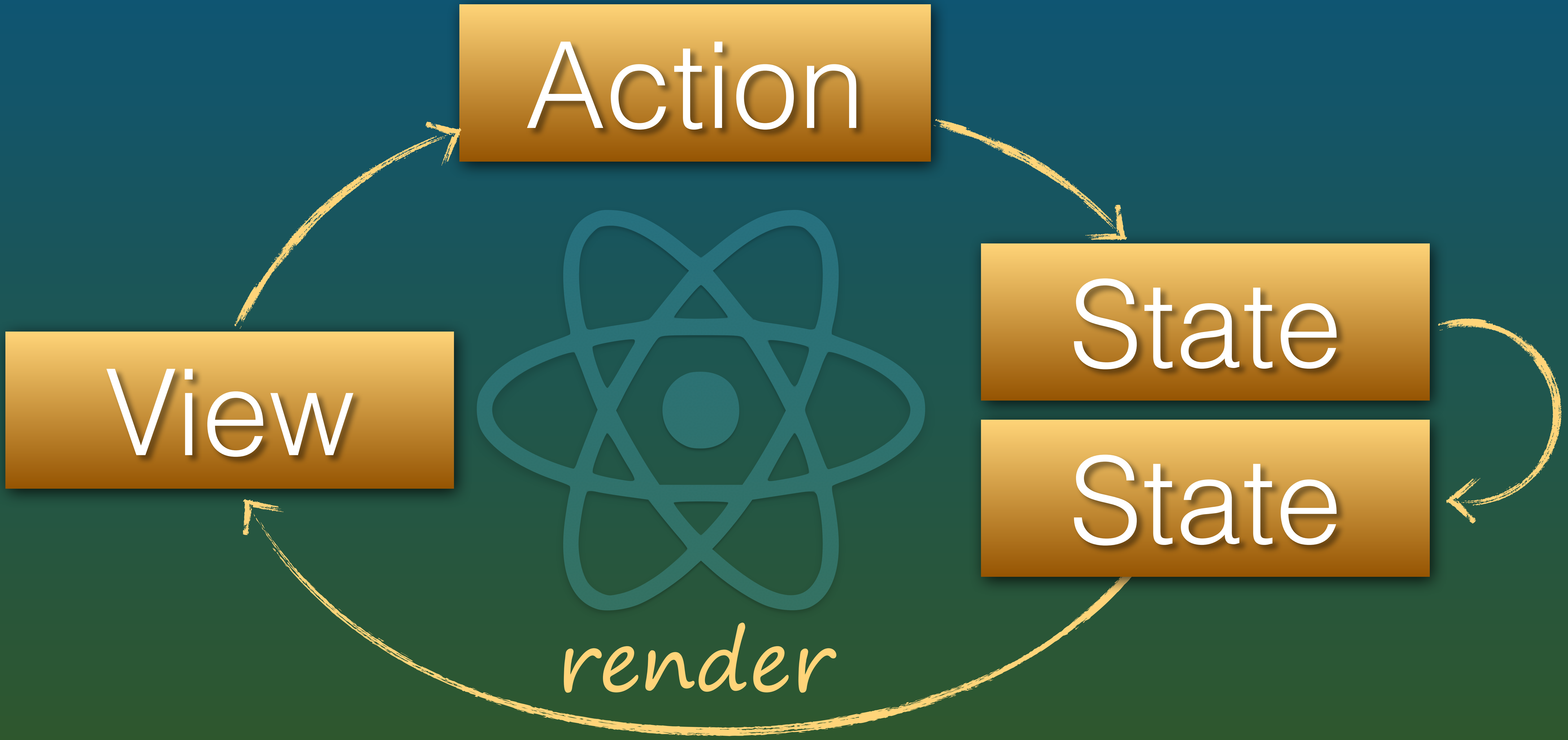
What they have in common

Allow React/Elm Architecture

for functional JavaScript/SPA

- TypeScript + React
- PureScript + Pux / Halogen
- Elm

The Cycle



Action

State

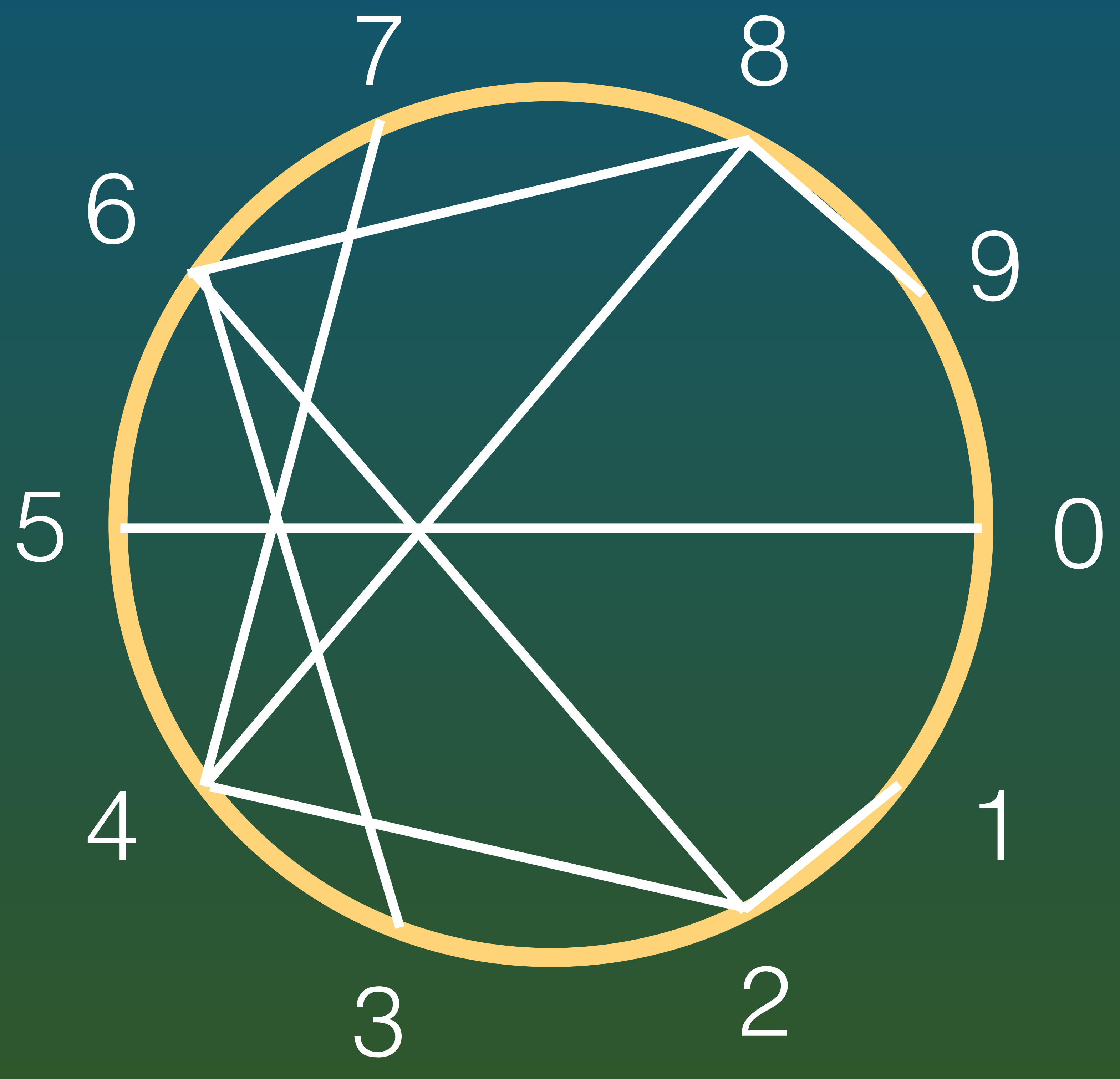
State

View

render

Example: Multiplication Table

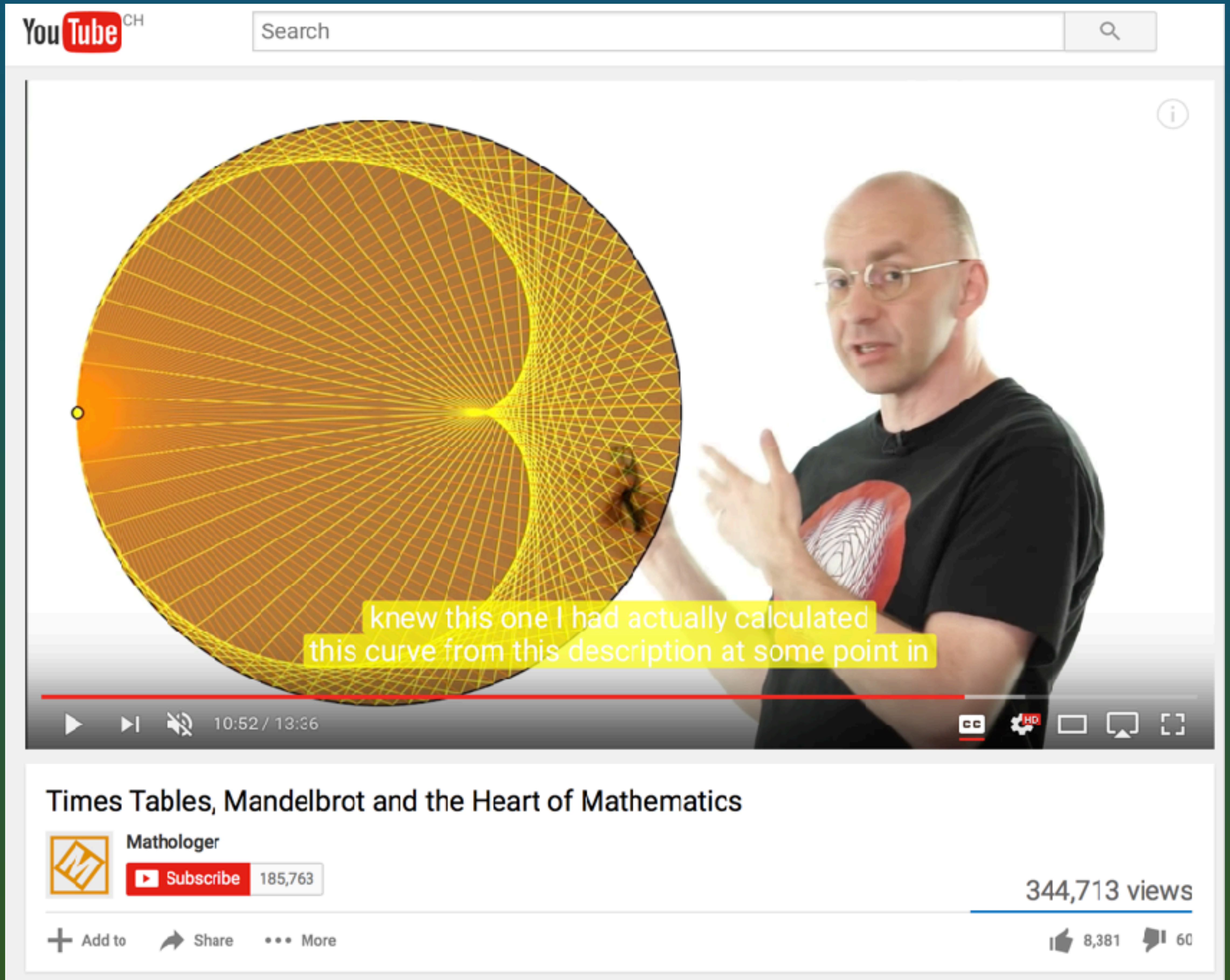
n	* 2
1	2
2	4
3	6
4	8
5	10
6	12
7	14
8	16
9	18



Demo

https://
dierk.github.io/
tryPux/
beautifulMathInTS/
index.html

Times Tables, Mandelbrot and the Heart of Mathematics



knew this one I had actually calculated
this curve from this description at some point in

Times Tables, Mandelbrot and the Heart of Mathematics

Mathologer

344,713 views

https://www.youtube.com/watch?v=qhbuKbxJsk8

TypeScript

Typed state

Actions as functions/lambdas

State immutability with discipline

Object/component abstraction

Elm

Typed state

Action type with values

State is immutable

Update function is a fold

Function composition

PureScript / Pux

Like Elm

but even more Haskell-ish

Calling JavaScript (FFI)

TypeScript	*Type declaration*	
PureScript	*Type declaration*	
Elm	*Port/Flag*	

Applicability

TypeScript	*JS Environment*	🍊
PureScript	*JS Environment*	🍊
Elm	*Browser*	🍎

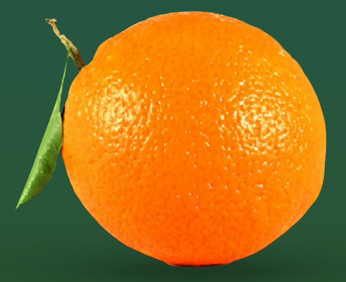
Paradigm

TypeScript	*OO with Generics*	
PureScript	*Functional*	
Elm	*Functional*	

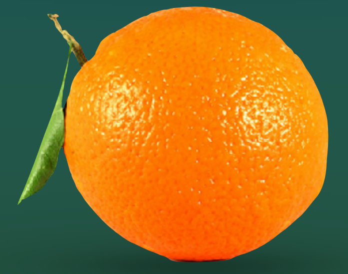
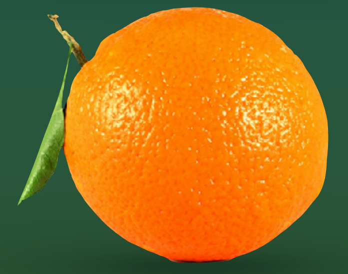
Approach

TypeScript	*Language*
PureScript	*Language + Tools*
Elm	*Programming System*

Cool

TypeScript	*Sum (union) type,* *String Literal type*	
PureScript	*Eff Monad, [GADT]*	
Elm	*Time travel debug,* *SemVer guarantee*	

More Transpilers

ClojureScript	*Clojure(Lisp)*	
GHCJS	*Haskell*	
Babel	*JS*	
CoffeeScript	*JS++*	
GrooScript	*Groovy*