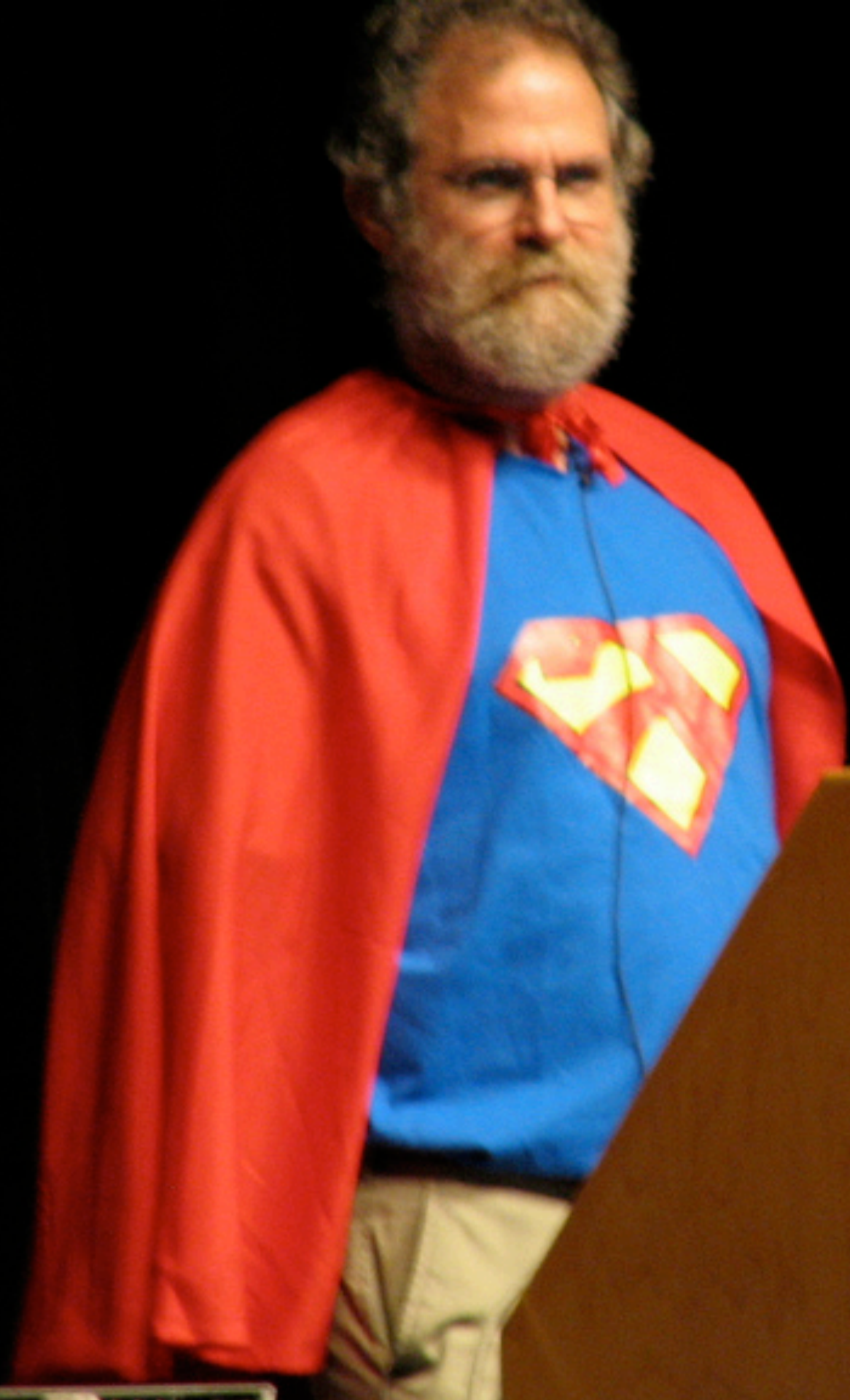


THE ESSENCE OF FUNCTIONAL PROGRAMMING



MY TALK TODAY

1. A little background
2. Foundations
3. Monads
4. Monad laws
5. (Maybe CPS)

**OUR LITTLE
INTERPRETER**

THE PROBLEM

```
term0 = (App (Lam "x" (Add (Var "x") (Var "x")))
          (Add (Con 10) (Con 11)))
```

$$((\lambda x. x + x)(10 + 11))$$

**WHAT IS A
MONAD?**



FOR THE PURPOSES OF THIS PRESENTATION...

A MONAD IS A TRIPLE $(M, \text{unit}_M, \text{bind}_M)$, THESE BEING

```
-- a type  
type M
```

```
-- construct computation from value type  
unitM :: a -> M a
```

```
-- apply a function to a computation  
bindM :: M a -> (a -> M b) -> M b
```

EXAMPLES

REFERENCES:

- ▶ Philip Wadler's Essence of Functional Programming

<http://homepages.inf.ed.ac.uk/wadler/topics/monads.html>

- ▶ Ralf Lämmel's The quick essence of functional programming

<https://channel9.msdn.com/Shows/Going+Deep/C9-Lectures-Dr-Ralf-Lmmel-AFP-The-Quick-Essence-of-Functional-Programming>

QUESTIONS?

THANK YOU!