

Wybe

**Formal verification
for the masses**

Testing vs Proving

$2 + 2$		$x + x$
$= \{ \text{addition rules} \}$		$= \{ \text{basic algebra} \}$
4		$2 * x$

Rules for transforming programs

```
if ¬true then A else B  
= { applying ¬ }  
  if false then A else B  
= { semantics of the if statement }  
  B
```

Smart contracts

- It's important to sleep at night if you're responsible for a smart contract holding valuable assets
- Formal verification can and has been applied successfully to make more secure smart contracts

Formal Land

- Ethereum, Tezos, Sui, Aleph Zero



<https://formal.land>

Why it's not used more?

- Dependent types
- Niche platforms and languages
- PhD level knowledge



```
1 +1-length : ∀ {ℓ}{A : Set ℓ}(h : A)(t :  $\mathbb{L}$  A) → length (h :: t) ≡ length t + 1  
2 +1-length h [] = refl  
3 +1-length h t = refl
```

A bridge

- F# and .NET
- Simpler yet powerful language
- A work in progress

```
1 let ``double negation`` =  
2   proof () {  
3     Theorem("double negation", !(!x) == x)  
4     withLaws { ``true theorem`` }  
5     !(!x) == x  
6     ``==`` { ``GS 3.11`` }  
7     !x == !x  
8     ``==`` { ``≡ ident`` }  
9     True  
10  }
```

Reactions



Luis
@lamg_dev

Promote



#fsharp now we have a proof checker embedded in F#'s computation expressions WIP

[Traducir con DeepL](#)

```
1 let ``double negation`` =  
2   proof () {  
3     Theorem("double negation", !(!x) == x)  
4     WithLaws [ trueTheorem ]  
5     !(!x) == x  
6     ``==`` { ``GS 3.11`` }  
7     !x == !x  
8     ``==`` { ``== ident`` }  
9     True  
10  }
```

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View post engagements



1



13



73




9





Reactions


Reactions


All 25

 19


 2

 2


 2




Guillaume Claret · 1st
Security Researcher @Formal Land - Formal verification for Web3
- Solidity, Rust, OCaml




Jonas Lara · 1st
Full Stack Developer




Vinícius Gajo Marques Oliveira · 1st
Software & Infrastructure Engineer | Open-source contributor |
DevOps/DevSecOps | Mechatronics Engineer



Don Syme · 1st
Principal Researcher, Visiting Professor























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10 years ago

"Llegué a este estilo por mi preocupación de escribir los programas bien, pues los errores se me escapaban al escribir un programa y notaba que estaban ahí cuando los ejecutaba", afirma.



Luis Ángel Méndez, un bicho raro entre sus colegas. Foto: Eduardo González Martínez

El método Dijkstra se opone a la práctica imperante de escribir un programa primero y someterlo después a una corrección matemática. Con su propuesta, aunque más demorada, se obtiene un programa listo para ejecutarse, correcto desde su construcción.

<https://eltoque.com/programar-sin-computadora>

Questions?

- <https://github.com/lamg>