cppcon
the c++ conference

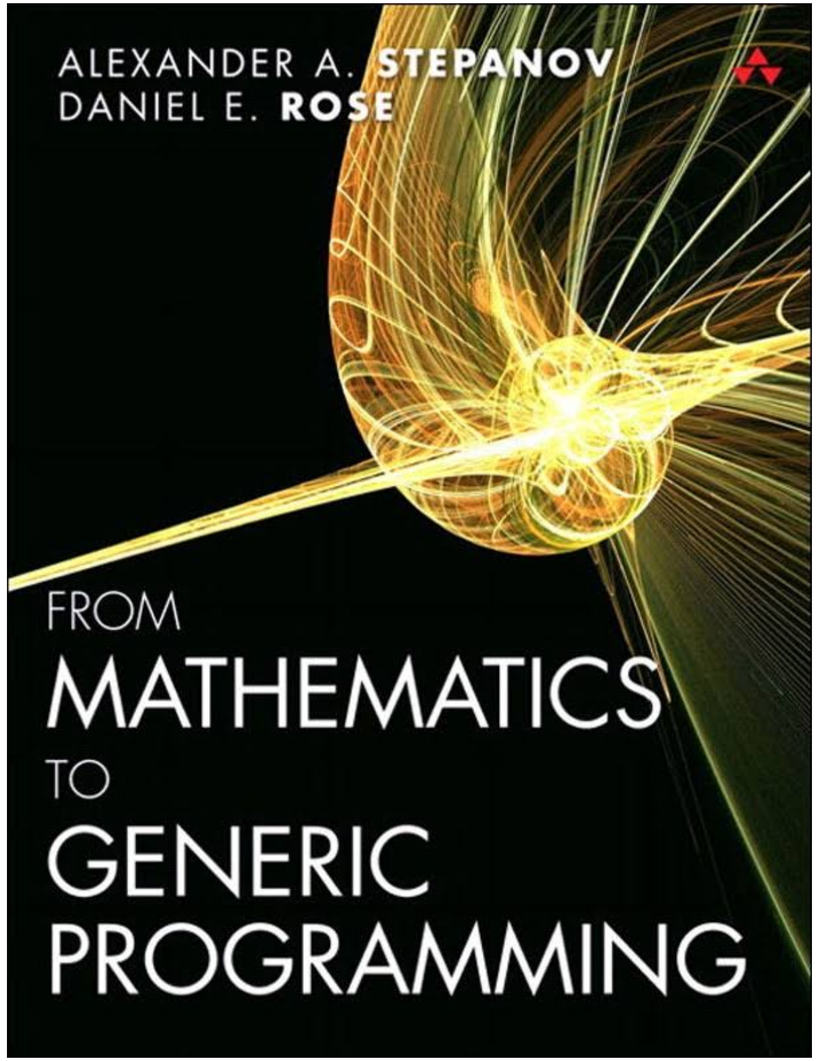
10 Things Junior C++ Devs Don't Get

Lightning Talks
September 28, 2017

Victor Ciura
Technical Lead, Advanced Installer
www.advancedinstaller.com

Math is Important

- Egyptian multiplication ~ **1900-1650 BC**
- Ancient Greek number theory
- Prime numbers
- Euclid's GCD algorithm
- Abstraction in mathematics
- Deriving generic algorithms
- Algebraic structures
- Programming concepts
- Permutation algorithms
- Cryptology (RSA) ~ **1977 AD**



I recommend you start with this book 👆

Generic Programming

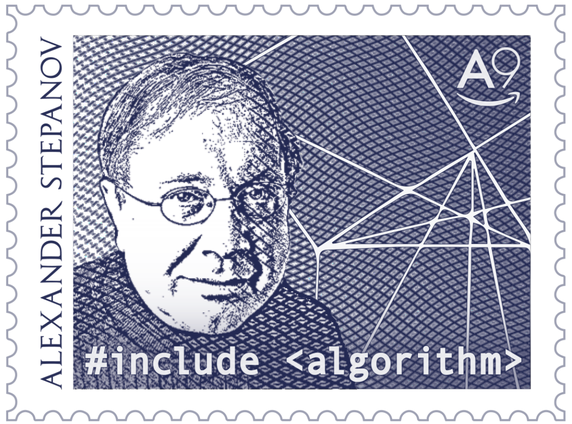
- algorithms are associated with a **set of common properties**

  Eg. `{ +, *, min, max }` => associative operations
  => reorder operands
  => parallelize + reduction (`std::accumulate`)

- find the most *general* representation of algorithms (**abstraction**)

- exists a **generic algorithm** behind every WHILE or FOR loop

- natural extension of 4,000 years of **mathematics**



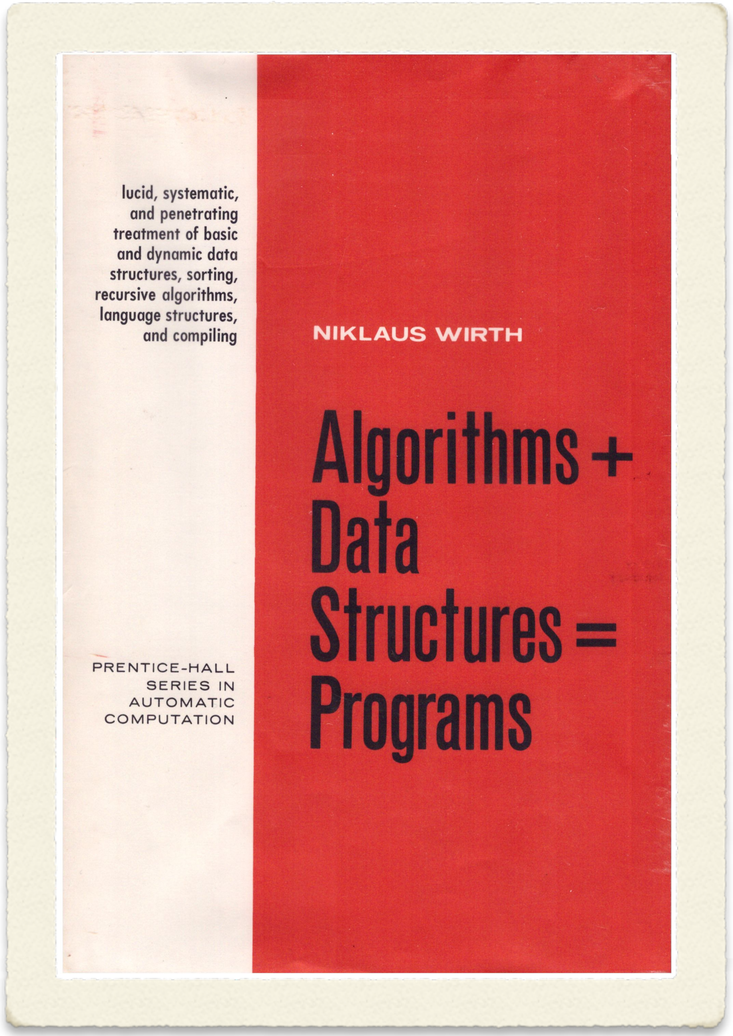
"STL and Its Design Principles"
by **Alexander Stepanov** (2002)

https://www.youtube.com/watch?v=COuHLky7E2Q

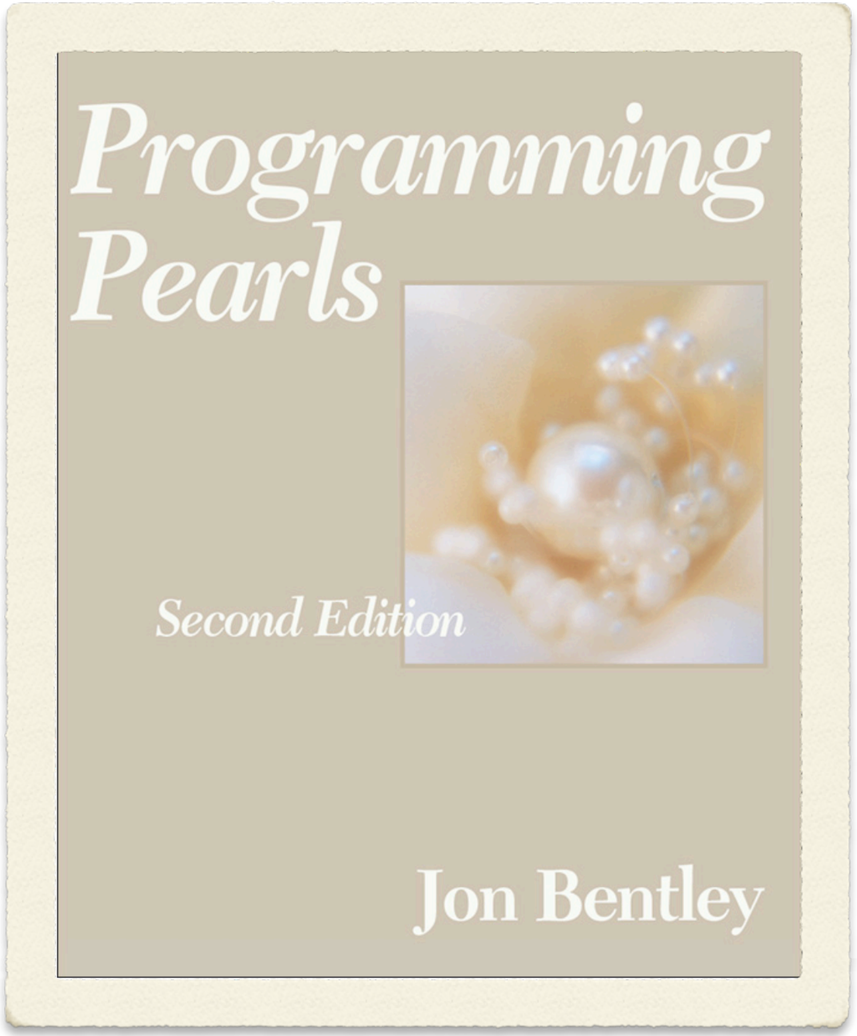
Books Are Still A Thing

Even slightly older books...

Just two examples:



1976



1986

Because these books teach the **core** concepts, the fundamentals, which do not change over years.

The Difference Between Efficiency and Performance

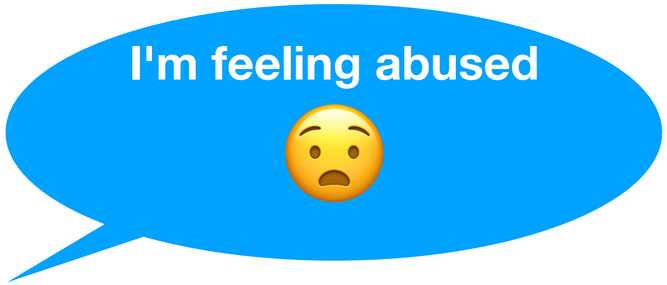
🤔 Why do we care ?

Because: “Software is getting slower more rapidly than hardware becomes faster.”

“A Plea for Lean Software” - Niklaus Wirth

Efficiency	**Performance**
the amount of work you need to do	how fast you can do that work
governed by your algorithm	governed by your data structures

Smart Pointers Are Not Panacea



`std::shared_ptr<T>`

✋ 'nuff said !

Single Responsibility Principle

👉 We've all seen this class

Exception Safety

It's not about throwing and catching exceptions !

`Basic exception guarantee`

`Strong exception guarantee`

`RAII`

`noexcept`

Documentation Matters

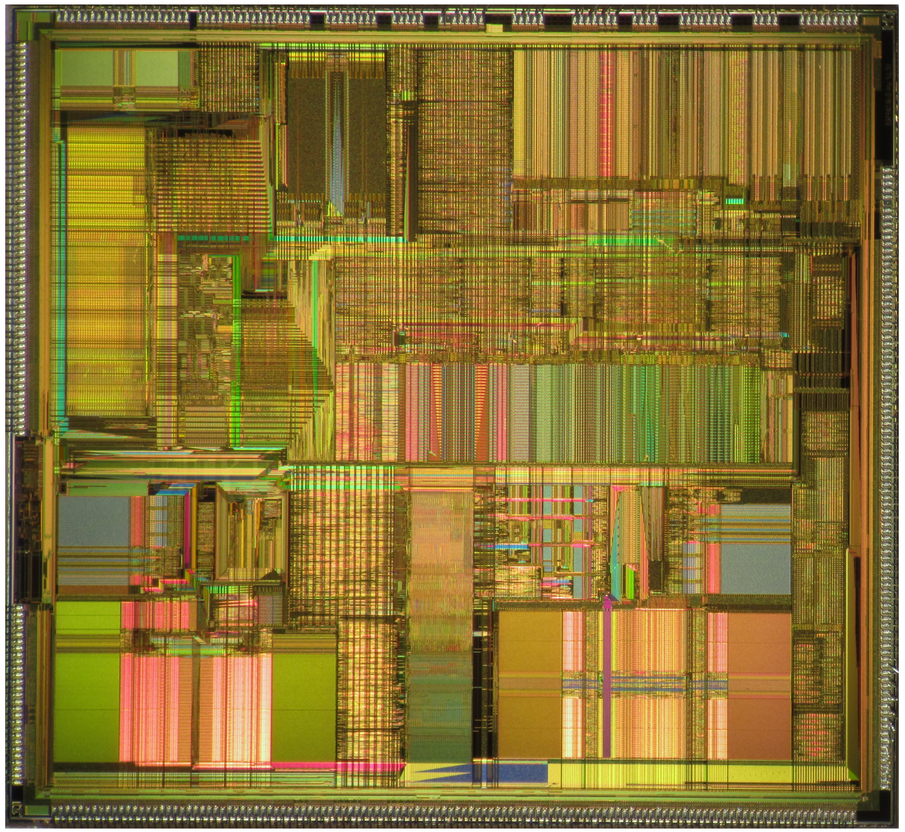
Write documentation with the same rigour as you write code.

Express your intent/design clearly, in plain good English.

```
// this includes your comments
```

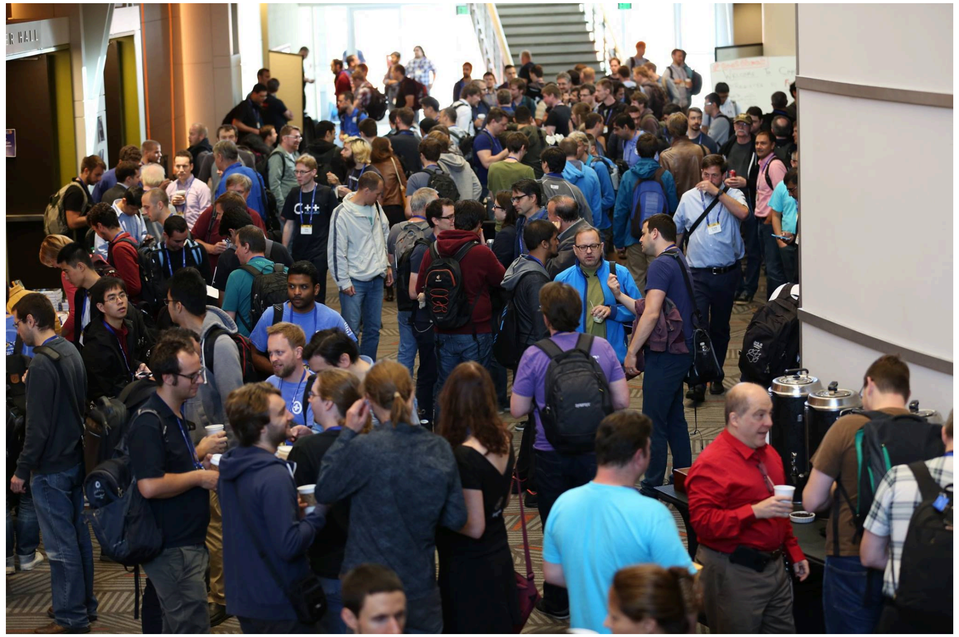
CppCon 2017 - Lightning Talk about comments, by **Walter E. Brown**

Computer Architecture



Know the machine you're programming

Attending conferences is not just about the sessions



People 🤓