

Kick-starting *Rust* for Web Dev

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COSCUP 2019, Taipei

別跑，是中文的.....



Me

- 舒欣 / Andy Shu
- Former chief engineer at matters.news
 - Frontend + Backend
- Founder of Immux
 - Building a functional computing service
 - Immutable database
 - Server-side Redux
- shu@immux.com

What is Rust

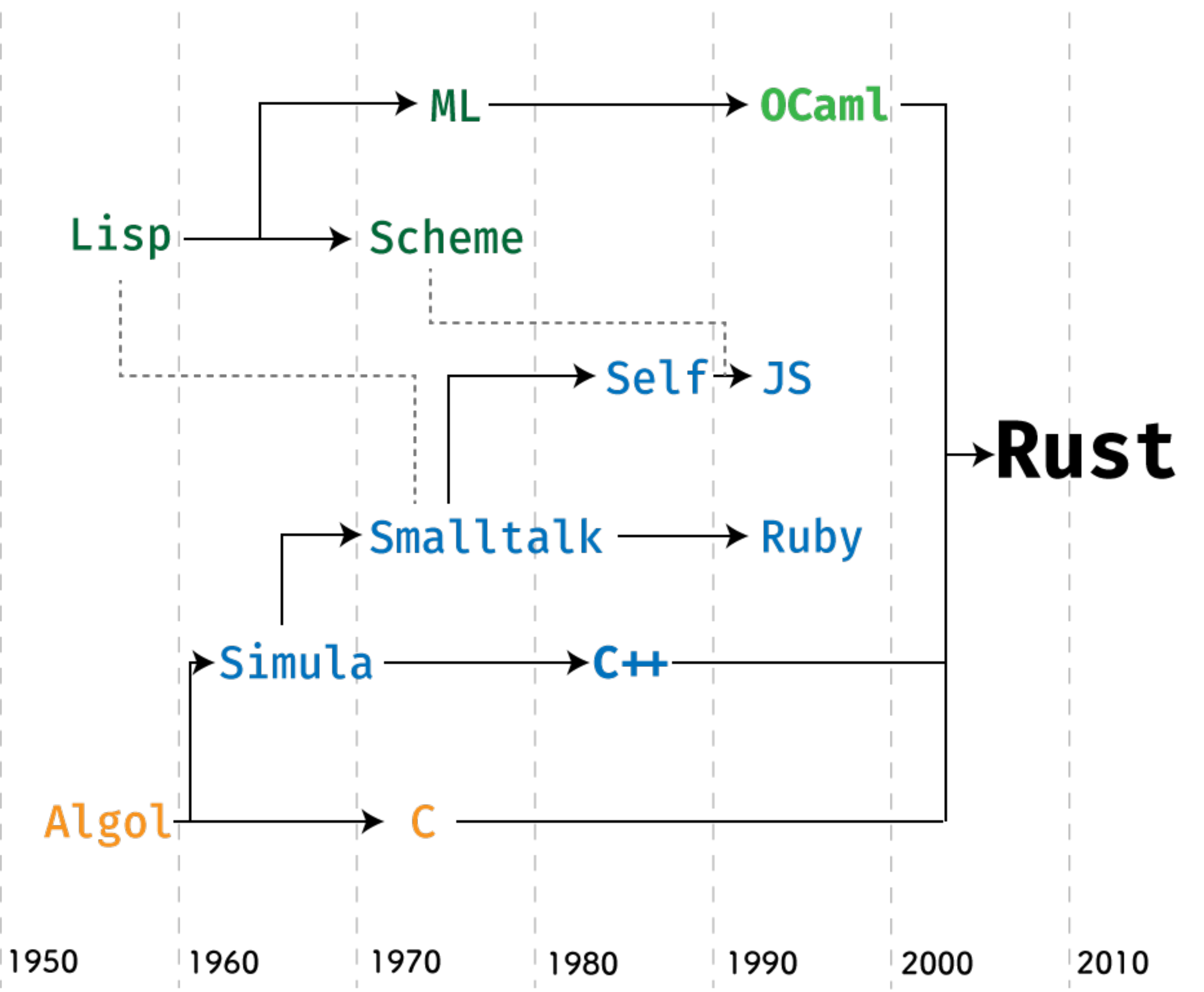


History of Rust

- Started as a hobby project of **Graydon Hoare** in ~2006
- Picked up by **Mozilla** in 2010
- Rust **1.0** in **2015**
- Maintained by community
- Open-source

Rust's design goals

- **Fast, safe, concurrent** systems language for everyone
 - **Fast:** similar to C++
 - No GC, Machine code, concurrency
 - **Safe:** Strong & static typing, no undefined behaviour, no data race
 - No manual malloc() and free() either

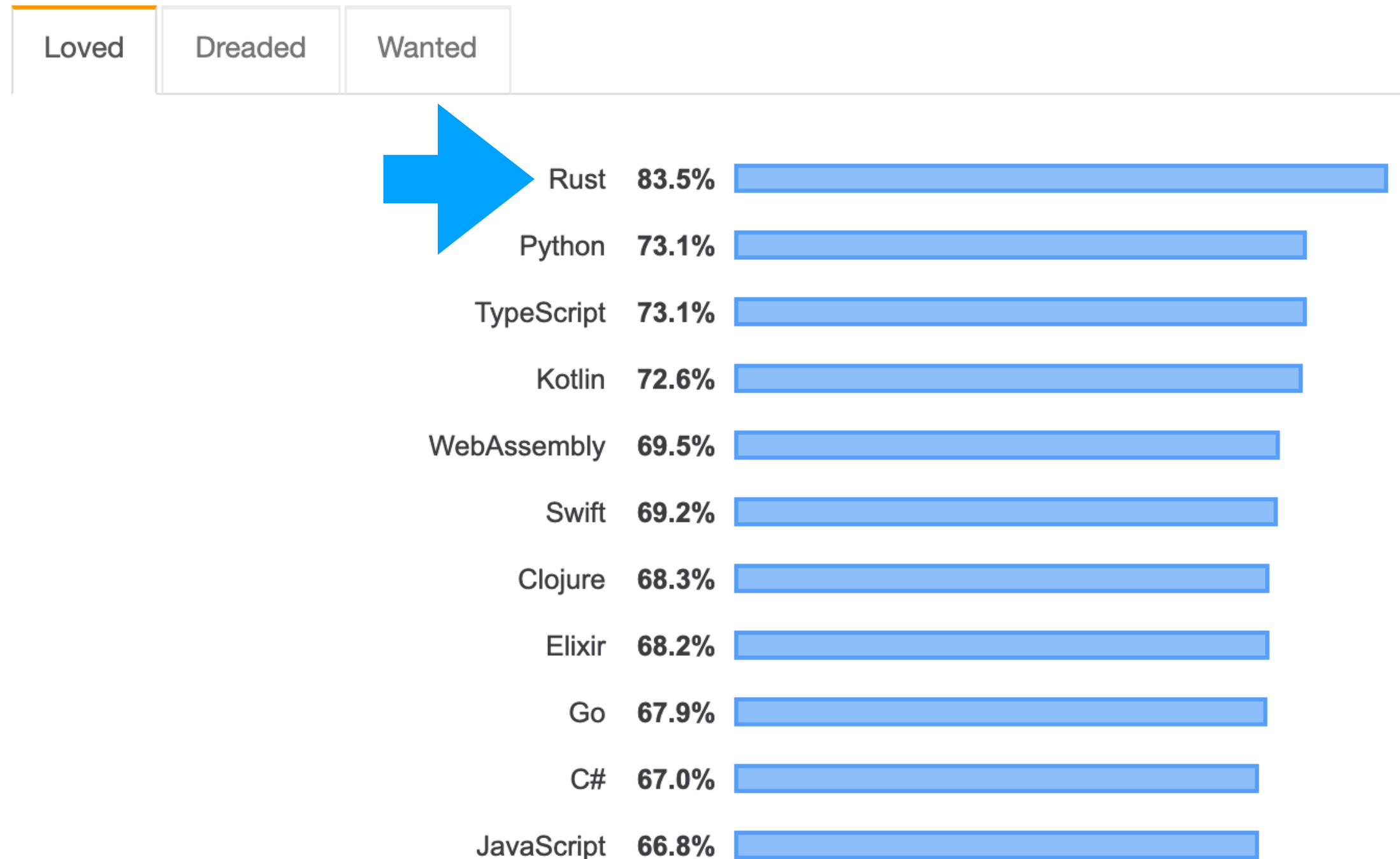


StackOverflow users's Most loved language

4 years in a row

2019

Most Loved, Dreaded, and Wanted Languages



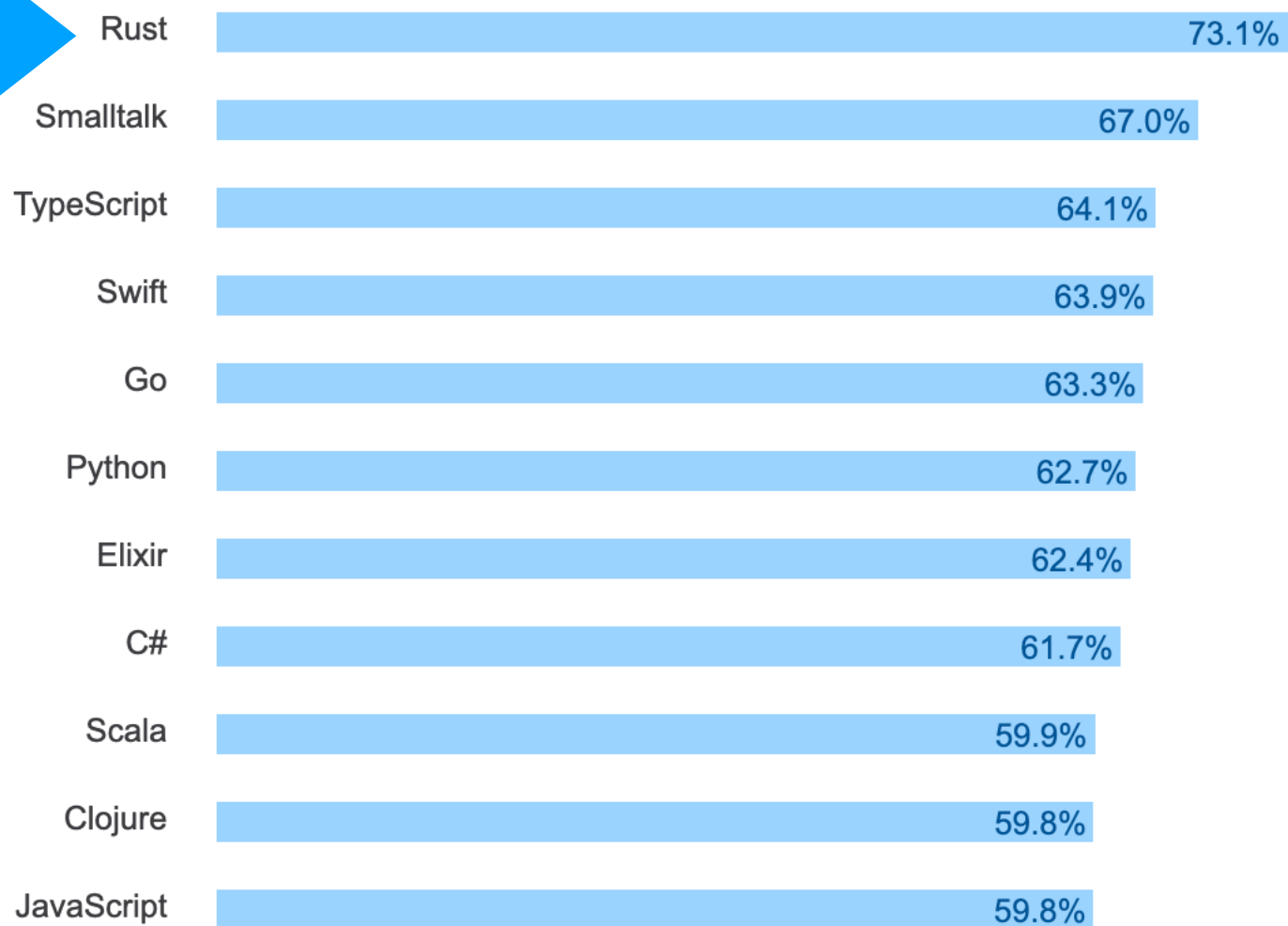
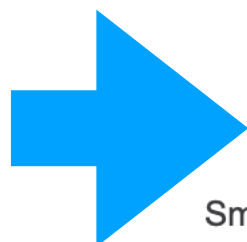
2017

Most Loved, Dreaded, and Wanted Languages

Loved

Dreaded

Wanted

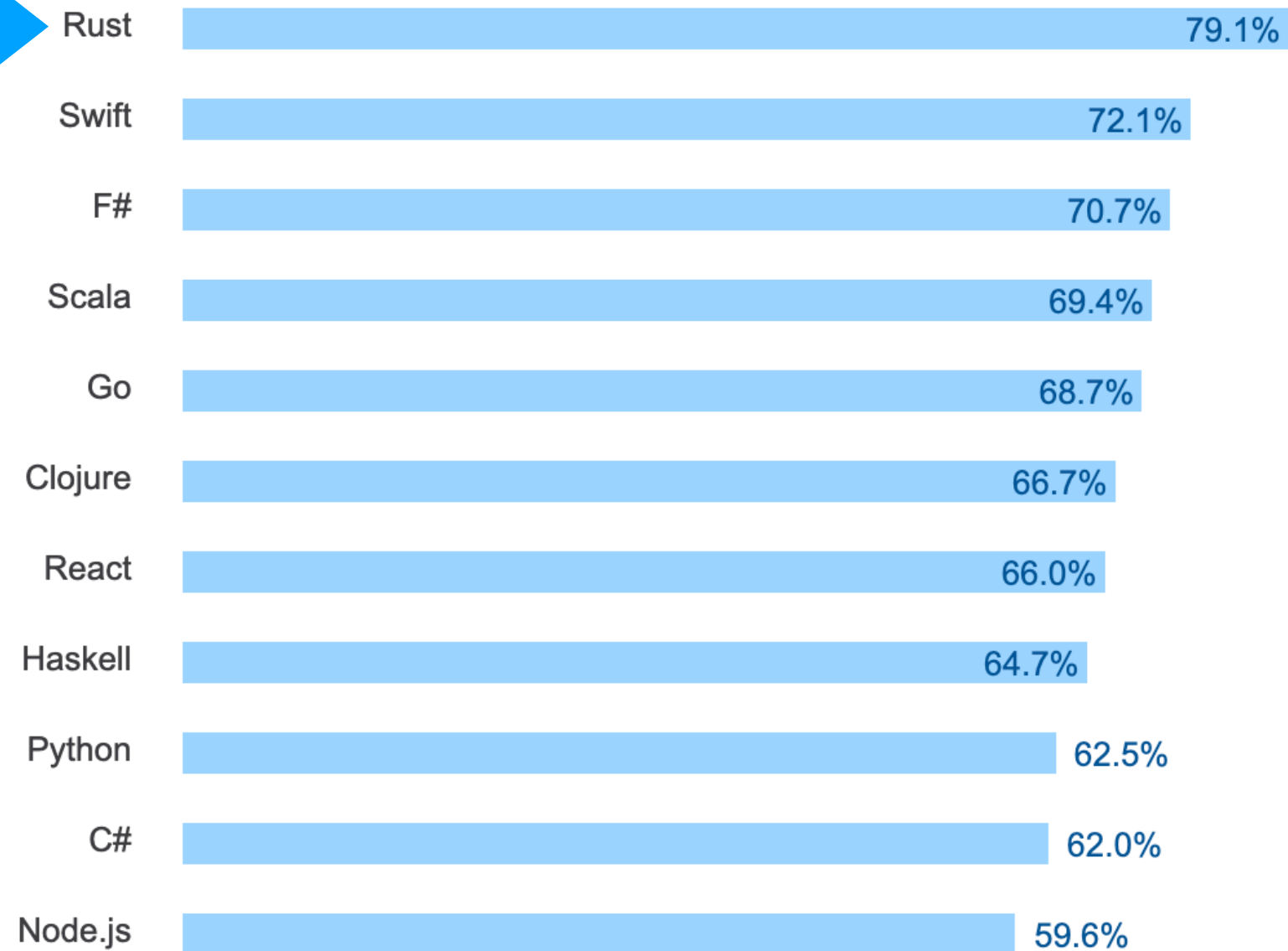
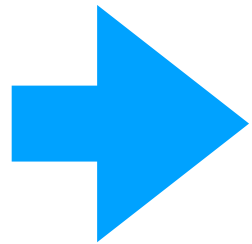


2016

Loved

Dreaded

Wanted



Rust projects?

Facebook Libra

 libra / libra

 Watch

630

 Star

11,895

 Fork

1,655

 Code

 Issues 85

 Pull requests 55

 Security

 Insights

Libra's mission is to enable a simple global currency and financial infrastructure that empowers billions of people. <https://libra.org>

 587 commits

 3 branches

 0 releases

 62 contributors

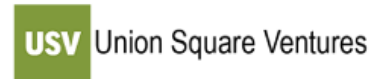
 Apache-2.0

 Rust 97.2%

 HTML 1.1%

 Other 1.7%

<https://github.com/libra/libra>



“Why was Rust chosen”?

Why was the Rust language chosen?

USER-CREATED CLIP
BY DTOLNAY
JULY 17, 2019

Why was the Rust language chosen?



MR. RIGGLEMAN

C-SPAN
c-span.org

Clip </> Embed + Add to Playlist

Clipping Guide

Share This Video

<https://www.c-span.org/video/?c4808083/rust-language-chosen>

Deno

 denoland / deno

 Watch

1,437

 Star

37,563

 Fork

1,731

 Code

 Issues

220

 Pull requests

16

 Security

 Insights

A secure JavaScript/TypeScript runtime built with V8, Rust, and Tokio <https://deno.land/>

 1,793 commits

 19 branches

 52 releases

 147 contributors

 MIT

● TypeScript 41.5%

● Rust 39.7%

● Python 8.5%

● C++ 5.6%

● JavaScript 2.8%

● HTML 1.3%

● Other 0.6%

<https://github.com/denoland/deno>

Deno

- From Ryan Dahl (creator of Node.js)
- TypeScript runtime, built with Rust
- Security-focused

Actix

 **actix** / **actix**

 Watch

103

 Star

3,258

 Fork

214

 Code

 Issues **27**

 Pull requests **9**

 Projects **0**

 Security

 Insights

Actor framework for Rust

rust

actor

actor-model

actix

concurrency

 **761** commits

 **7** branches

 **43** releases

 **62** contributors

 View license

 **Rust 99.7%**

 **Makefile 0.3%**

A fast web framework


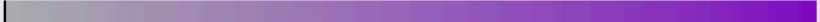















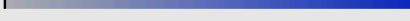


Best (bar chart)

Data table

Latency

Framework overhead

Best fortunes responses per second, Azure D3v2 instances (385 tests)

Rnk	Framework	Best performance (higher is better)	Errors	Cls	Lng	Plt	FE	Aos	DB	Dos	Orm	IA
1	 actix-core	88,901  100.0%	0	Plt	Rus	Non	act	Lin	Pg	Lin	Raw	Rea
2	 actix-pg	87,159  98.0%	0	Mcr	Rus	Non	act	Lin	Pg	Lin	Raw	Rea
3	 vertx-postgres	67,961  76.4%	0	Plt	Jav	ver	Non	Lin	Pg	Lin	Raw	Rea
4	 greenlightning	58,616  65.9%	0	Mcr	Jav	Non	Non	Lin	Pg	Lin	Raw	Rea
5	 h2o	54,323  61.1%	0	Plt	C	Non	Non	Lin	Pg	Lin	Raw	Rea
6	 atreugo-prefork-quicktemplate	48,417  54.5%	0	Plt	Go	Non	Non	Lin	Pg	Lin	Raw	Rea
7	 fasthttp-postgresql	48,222  54.2%	0	Plt	Go	Non	Non	Lin	Pg	Lin	Raw	Rea
8	 atreugo-quicktemplate	47,227  53.1%	0	Plt	Go	Non	Non	Lin	Pg	Lin	Raw	Rea
9	 swoole	46,804  52.6%	0	Plt	PHP	Non	swo	Lin	My	Lin	Raw	Rea
10	 rapidoid-postgres	45,891  51.6%	0	Plt	Jav	Rap	Non	Lin	Pg	Lin	Mcr	Rea

Fortune, Web Framework Benchmarks, TechPower, 2019-07-09/Round18



web framework performance



All

Images

Videos

News

Maps

More

Settings

Tools

About 246,000,000 results (0.78 seconds)

Web Framework Benchmarks - TechEmpower

<https://www.techempower.com/benchmarks/> ▼

Web Framework Benchmarks. Please enable JavaScript. We load results data from JSON files and use JavaScript to render the results as charts and data tables. ... Platform, meaning a raw server (not actually a **framework** at all).

the-benchmark/web-frameworks: Which is the fastest web ... - ...

<https://github.com/the-benchmark/web-frameworks> ▼

Aug 3, 2019 - Which is the fastest **web framework**? ... node · [Javascript] Update nanoexpress to latest and improve **performance** (#1636, 9 days ago.

TechEmpower/FrameworkBenchmarks: Source for the ... - GitHub

<https://github.com/TechEmpower/FrameworkBenchmarks> ▼

Welcome to TechEmpower **Framework** Benchmarks (TFB) ... provides representative **performance** measures across a wide field of **web** application frameworks.

TiKV

tikv / tikv

Watch 304

Star 5,795

Fork 851

Code

Issues 395

Pull requests 51

Projects 5

Wiki

Security

Insights

Distributed transactional key-value database, originally created to complement TiDB <https://tikv.org>

distributed-transactions

raft

rust

key-value

tikv

consensus

rocksdb

tidb

cncf

3,947 commits

19 branches

66 releases

177 contributors


Apache-2.0

Rust 99.5%

Other 0.5%




<https://github.com/tikv/tikv>






Google Fuchsia



Fuchsia OS

Project ID: 94

 Fuchsia  Mirror  China

 **BSD 3-clause "New" or "Revised" License**  **58,177 Commits**  **57 Branches**  **0 Tags**  **0 Bytes Files**


Fuchsia OS 的源代码，由 Fuchsia 中文社区维护，托管地址 <https://mirrors.hexang.com/fuchsia>

master ▼

fuchsia

Rust 13.6%

Find file

 ▼

<https://fuchsia.dev/>

**You already know
some Rust**

Define variables

RS

```
let c = 1;  
c = 2; // error
```

```
let mut m = 10;  
m = 20;
```

JS

```
const c = 1;  
c = 2; // error
```

```
let m = 10;  
m = 20;
```


functions

RS

```
fn is_even(n: i16) -> bool {  
    return n % 2 == 0  
}
```

PY

```
def is_even(n: int) -> bool:  
    return n % 2 == 0
```

PY

```
def is_even(n):  
    return n % 2 == 0
```

Iterate over array

```
RS [1, 2, 3].iter().for_each(  
    |num| println!("got {}", num)  
)
```

```
RB [1, 2, 3].each {  
    |num| puts "got #{num}"  
}
```

Define object shapes

```
RS struct Human {  
    alive: bool,  
    age: u16,  
}
```

```
TS interface Human {  
    alive: bool,  
    age: number,  
}
```

Create objects

RS

```
let andy = Human {  
    alive: false,  
    age: 80,  
};
```

JS

```
let andy = {  
    alive: false,  
    age: 80,  
};
```

Talk is cheap, Show me the code

Live-coding an SPA click counter

Yew



Interested?

- Stay in the track!
- Are we web yet? <https://www.arewewebyet.org/>
- Playground <https://play.rust-lang.org/>
- Learn: <https://www.rust-lang.org/learn>
- Join Rust Telegram groups (in Chinese)
 - https://t.me/rust_tw
 - https://t.me/rust_zh

Thanks!

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