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Cpp2Rust

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70% of vulnerabilities at Google Microsoft are memory safety bugs

Safe programming languages (Rust) fix memory safety bugs!

cpp2rust generates safe Rust then optimizes for speed

1st
automatic C++ → Rust translator

100%
safe code, by construction

2%
low performance overhead

>13K
lines of security-sensitive C++ code

`Ptr` uses `Rc<RefCell<T>>` to ensure runtime safety

C++

```
int *p = new int{8};
int *q = p;
free(q);
// 💥 use-after-free
return *p;
```

Cpp2Rust

Safe Rust

```
let p = Ptr::new(8);
let q = p.clone();
q.delete();
// ✅ safe abort
return p.read();
```

Optimizer (Safe Rust -> Safe Rust) removes
71-87% of safe constructs in the generated code

Rc | RefCell | Option | Ptr (in progress)

Bug-free translation (us) vs
20 bugs (Google manual porting)

STL | OOP | void* | lambdas

As low as 2% perf overhead on
woff2 (5K LoC) and brunsli (8K LoC)

>13K (now)
lines of security-sensitive C++ code

cURL (near future)
>100K lines of one of the most installed software ever

Cpp2Rust: Automatic Translation of C++ to Safe Rust. **PLDI'26 (A*).** https://doi.org/10.1145/3808266

Open-source!

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