

C++ Club UK Meeting 122

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2021-02-18

“Why C and C++ are Awful Programming Languages”

- Article by Ian Barland, Radford University (!)
 - [Reddit](#)
- Modern C++ Won't Save Us, by Alex Gaynor

What (relatively) easy to implement features would you like to see in C++23?

- [Reddit](#)

Possibility of adding operators to handle nullptr easier (“??”, “?→”)

- [Reddit](#)

Purely academic purposes Compile-time Turing Machine in C++20

- GitHub
 - Reddit

X-Macros

- Arthur O'Dwyer
 - Reddit

Interesting technique, I hate it. #

C++ HTML

- J.F. Bastien

“Why is C++ so terrible when it comes to date/time manipulation?”

Spoiler: it isn't

- [Reddit](#)

Is Zero a Butterfly?

- Shafik Yaghmour
 - Reddit

Polymorphism Decision Table

- Kilian Henneberger

Infix Function Calls with Boost HOF

- Jo Boccara
 - Reddit

Before

```
1 | const bool b = isPrefixOf(prefix, text);
```

After

```
1 | const bool b = prefix <isPrefixOf> text;
```

YAVE: Functional reactive visual programming language written in C++20

- [Reddit](#)
 - [GitHub](#) (C++20, LGPL)

Adding elements to arrays and changing variables during compilation – imperative meta-metaprogramming in C++

- Dugi
 - Reddit

Data-Oriented Design and Avoiding the C++ Object-Oriented Programming Zimmer Frame

- Article by Leigh Johnston
 - [Reddit](#)

When can the C++ compiler devirtualize a call?

- Arthur O'Dwyer
 - Reddit

std::optional and other useful types

- **Reddit**

Variants suck. But you can get good performance with esoteric tricks. And even if you don't use them well, they'll still be faster than virtual inheritance

- [Reddit](#)

With `std::variant`, you choose either performance or sanity

- Reddit

MSVC build performance

- Improving code generation time with C++ Build Insights
- Faster C++ builds, simplified: a new metric for time
- The Coalition Sees 27.9X Iteration Build Improvement with Visual Studio 2019
- Faster C++ Iteration Builds
 - Reddit
- C++ Build Analyzer
 - C++ Build Insights SDK

The most thoroughly commented linker script (probably)

- Stargirl
 - GitHub
 - Reddit

How can I write a C++ class that iterates over its base classes?

- Raymond Chen
 - Reddit

Template specialization and instantiation

- Xiang Fan, Microsoft
 - Reddit

C++ Performance Trap #1: Constant-size std::vector

- Scott Wolchok
 - [Reddit](#)
 - [Software optimization resources, by Agner](#)

C++ Performance Trap #2: Unnecessary std::function

- Scott Wolchok
 - Reddit

Inlining and Compiler Optimizations

- Scott Wolchok
 - Reddit

The perils of the accidental C++ conversion constructor

- Raymond Chen
 - Reddit

No one hates C++ more than the people who love C++. #

Making Win32 APIs More Accessible to More Languages

- Microsoft
 - C++/WinRT

C++ and game engines

- Reddit

Hey, I started out with C++ 3 months ago and really love it. I already have some experience in Unity, but I'd like to use C++. Is there any engine you would recommend me to try out? I know about Unreal Engine but I can't find any good tutorials for how to use C++ with Unreal Engine. Is there any other option or a tutorial series or anything you could recommend me?

Game developers, what compiler optimization setting do you use?

- [Reddit](#)

EnTT 3.6.0

Gaming meets modern C++ - a fast and reliable entity component system (ECS) and much more.

- [Announcement on Reddit](#)
 - [GitHub](#) (C++17, MIT)

Anonymous types in C++

- Jan Bielak
 - [Reddit](#)

```
1 constexpr auto simplify(struct_(int numerator, denominator;) ratio) ->  
    decltype(ratio)  
2 {  
3     int gcd = std::gcd(ratio.numerator, ratio.denominator);  
4     return { ratio.numerator / gcd, ratio.denominator / gcd };  
5 }
```

Documenting C++ code

- **Reddit**
 - Doxygen, Sphinx + Breathe \Rightarrow {fmt}
 - Standardese
 - clang-doc
 - hdoc
 - Adobe Hyde

CMake and the Future of C++ Package Management

- Borislav Stanimirov
 - [Reddit](#)

Fixed math header only library with MIT licence

- [Reddit](#)
 - [GitHub](#) (C++17, MIT)

Coderrect Scanner

A fast static analysis tool for detecting race conditions in C++ code.
Supports pthreads, `std::thread`, OpenMP, and more.

- [Home Page](#)
 - [Reddit](#)

A C++20 container concepts library

This library aims to provide general purpose concepts that are not available in the C++20 concepts library, most notably container concepts.

- [GitHub](#)
 - [Reddit](#)

Motivating examples of coroutines

- Reddit
- Previously: Reddit

std::jthread and cooperative cancellation with stop token

- [Article on Nextptr](#)
 - [Reddit](#)

Time Travel Debugging for C/C++

- Article
 - Reddit

Number Parsing at a Gigabyte per Second

- Daniel Lemire
 - Paper
 - Reddit
 - fast_float (GitHub)
 - The Eisel-Lemire ParseNumberF64 Algorithm
 - Go Systems talk (YouTube)

Abbreviated Function Templates and Constrained Auto

- Sy Brand, Microsoft
 - Reddit

Why no standard library support for command line parsing?

- **Reddit**
 - P0781R0 A Modern C++ Signature for main
 - TCLAP - Templatized Command Line Argument Parser: [SourceForge](#), [GitHub](#)
 - Gflags, [GitHub](#)
 - Cxxopts
 - CLI11
 - Boost.Program_options
 - Quick Arg Parser: [GitHub](#), [Reddit](#)
 - Lyra
 - Clara, [blog post by Marius Bancila](#)


```
1 | std::vector<std::string_view> args(argv, argv+argc);
```

Moving Faster: Everyday Efficiency in Modern C++

- C++Now 2018, YouTube
 - Reddit

C++ now


2018
MAY 7-11
cppnow.org



Alan Talbot

Moving Faster
Everyday Efficiency in
Modern C++

Video Sponsorship
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Add – A Case Study

```
class bar {  
    vector<foo> foos;  
public:  
    template<typename... T>  
    void add(T&&... t)  
    {  
        foos.emplace_back(forward<T>(t)...);  
    }  
};  
  
bar b;  
b.add(42, 3.1415, 'Q', "Bond");
```

Reference Views

rvIEWS (reference views) is a header-only C++17 library that allows viewing an STL container via another STL container with lvalue semantics. E.g. you could view a list as it would be a vector, or even as it would be a map, or even both.

```
1 std::list<char> data{'a', 'b', 'c'};
2 vector_view view{data};
3 std::cout << view[0] << std::endl; // a
4 std::cout << view[1] << std::endl; // b
5 std::cout << view[2] << std::endl; // c
```

- [GitHub](#)
 - [Reddit](#)
 - [See also: Vista](#)
 - [See also: Boost flat_map](#)

Conceptual

A C++20 library adapting preexisting `type_traits` into concepts, as well as improving upon the preexisting standard ones with better subsumption.

- [GitHub](#)
 - [Reddit](#)

C++ Memory Safety

- **Reddit**

Hot reloading C++ for rapid development with the help of **fungos/cr**

- Alex Dixon
 - fungos/cr
 - cr.h: A Simple C Hot Reload Header-only Library

Video: Pavel Novikov - “Understanding Coroutines by Example” - C++ London

- YouTube
 - Reddit
 - Slides

VirtualMultiArray

Multi graphics card based C++ virtual array implementation that uses OpenCL just for the data transfers on PCIe bridge.

- [GitHub](#)
- [Wiki](#)
- [Reddit](#)

Boosting Productivity and Performance with the NVIDIA CUDA

11.2 C++ Compiler

- NVIDIA
 - Reddit

All useful stuff for machine learning is written for cuda, so everyone is forced to buy Nvidia. Been waiting for opencl pytorch backend for years, but it just seems like nobody really has a reason to do it. #

Meson Build 0.57.0

- Release notes
 - [Reddit](#)
- [The Absolute Beginner's Guide to Installing and Using Meson](#)

Highlights

- Experimental support for C++ modules in Visual Studio
- **meson test** only rebuilds test dependencies
- Support added for LLVM's thinLTO

Portability: should we stop using int?

- Reddit

This library provides golang-inspired channel types to be used with ASIO awaitable coroutines. Channels allow bidirectional message passing and synchronization between coroutines.

- [GitHub](#) (C++20, MIT)
 - [Reddit](#)

Better CMake

- Videos by Jefferson Amstutz