

# C++ Club UK Meeting 122

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# “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](#)

## 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  
Provided By: 

## 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