

# C++ Club UK Meeting 121

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# Perhaps it's time for a more opinionated dialect of C++

- Reddit
- Should I litter my code with (the correct) attributes for every function, or just leave it pretty?

# Latest C++: theory vs. reality

- Reddit
  - Godot game engine C++ standard thread on GitHub

# C++ vs Rust performance

- [Reddit /r/cpp](#)
  - [Reddit /r/rust](#)

If you were allowed to make breaking changes to the C++ specification, what features would you modify/replace/remove to make the language better?

- **Reddit**

# A Year of Conference Talks from the Microsoft C++ Team

- Sy Brand
  - Reddit

# C/C++ Search Extension

- Website
  - Reddit

# Modern C++: Snippets and Examples

- Alan Freitas
  - Reddit



# Modern C++ Tip of the Week

- Quantlab

# INI-config

A single-header C++20 library that converts INI-formatted string literals to a key-value pair list at compile-time.

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

```
1 #include "ini_config.hpp"
2
3 constexpr auto config = R"(
4 [Cat]
5 color = gray
6 lives = 9
7 )"_ini;
8
9 for (auto kvp : config) {}
10 for (auto kvp : config.section("Cat")) {}
11 config.get("Cat", "lives"); // => "9"
12 config.get<int>("Cat", "lives"); // => 9
13 config.get("Dog", "lives"); // => ""
```

# mocxx: a versatile C++ function mocking framework based on Frida, by Guardsquare

No macros! Doesn't support mocking virtual functions yet.

- [Reddit](#)
  - [GitHub](#) (C++17, GPL-3.0)
    - [Frida - Dynamic instrumentation toolkit for developers, reverse-engineers, and security researchers](#)
  - [Explanatory blog post at Guardsquare](#)

# Compile 1 Million Lines Of C++ In ~2 Minutes With A 16 Core Ryzen 9 5950x

- Embarcadero
  - Reddit

*I love how a shitty, bug-ridden development environment that costs US\$1359 for the most basic edition still requires you to buy a separate US\$139 extension to enable parallel builds, a standard feature available on practically every other closed and open source compiler and build system out of the box for \$0 extra.*

## Dev-C++

A fast, portable, simple, and free C/C++ IDE for Windows, built in Delphi

- GitHub

## Using `std::list::splice` to implement a LRU cache

- [Article on nextptr](#)
- `std::list::splice`

## What should the state of a moved-from object be?

- Raymond Chen
  - Reddit

# Reducing Memory Consumption in Visual Assist

- Blog post
  - Reddit

# dont\_deduce

- artificial::mind
  - Reddit

## C++11

```
1 template <class T> struct foo_t { using type = T; };
2 template <class T> using foo = typename foo_t<T>::type;
```

## C++20

```
1 template <typename T>
2 auto operator+(
3     vec3<T> const& a,
4     std::convertible_to<T> auto const& b
5 ) -> vec3<T>;
```



## Writing a custom iterator in modern C++ (C++17)

- Article
  - Reddit

# C++ for Swift developers

- Sidharth Juyal
  - [Reddit](#)

## Wrapping C++ for use in Swift

- [Reddit](#)

# Is Zero a Butterfly?

- Shafik Yaghmour
  - Reddit

## std::optional and other useful types

- **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)

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

# 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;
```



# Polymorphism Decision Table

- Kilian Henneberger

# Tracy Profiler

A real time, nanosecond resolution, remote telemetry, hybrid frame and sampling profiler for games and other applications.

Tracy supports profiling CPU (C, C++11, Lua), GPU (OpenGL, Vulkan, OpenCL, Direct3D 12), memory, locks, context switches, per-frame screenshots and more.

- [GitHub](#)

# 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 cant 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

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

- Dugi
  - Reddit

# 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

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

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



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

- [Reddit](#)

# 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](#)

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

- GitHub
  - Reddit

# X-Macros

- Arthur O'Dwyer
  - Reddit

*Interesting technique, I hate it. ⇒*

## 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

- J.F. Bastien

# 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](#)

# Functional programmers

