

# C++ Club UK Meeting 124

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## Library: VirtualMultiArray

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

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

# Library: 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](#)

## Library: Asio-chan


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

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

# 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");
```

# 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);
```

# Number Parsing at a Gigabyte per Second

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

## std::jthread and cooperative cancellation with stop token

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



# Time Travel Debugging for C/C++

- Article
  - Reddit

# Abbreviated Function Templates and Constrained Auto

- Sy Brand, Microsoft
  - Reddit

## Library: C++20 container concepts

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

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

# Coderrect Scanner

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

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

## Library: Fixed math (header-only, MIT)

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

# Scientific computing in C++

- Reddit

## Libraries

- Eigen
- Blaze
- Boost uBLAS
- PETSc

# 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](#)



# Motivating examples of coroutines

- Reddit
- Previously: 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)

# Better CMake

- Videos by Jefferson Amstutz

# Solving differential equations with LLVM

Heyoka is a C++ library for the integration of ordinary differential equations (ODEs) via Taylor's method. Notable features include:

- support for both double-precision and extended-precision floating-point types (80-bit and 28-bit),
- the ability to maintain machine precision accuracy over tens of billions of timesteps, batch mode integration to harness the power of modern SIMD instruction sets,
- a high-performance implementation of Taylor's method based on automatic differentiation techniques and aggressive just-in-time compilation via LLVM.

## Links

- [GitHub](#) (C++17, MPL-2.0)
  - [Docs](#)
  - [Reddit](#)



# TTauri: modern retained-mode GUI library in C++20

- GitHub
  - Reddit

## C++20 Coroutines: sketching a minimal async framework

- Jeremy Ong
  - 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

## Library: Cli

A cross-platform header only C++14 library for interactive command line interfaces (Cisco style).

- [GitHub](#)

# Introduction to Lua in C++ with Sol2

- Hristo Stamenov

# Book erratum: Professional C++ by Marc Gregoire

- [Reddit](#)

*Statements of the form return object; trigger return value optimization (RVO) if object is a local variable, a parameter to the function, or a temporary value. Furthermore, if object is a local variable, named return value optimization (NRVO) can kick in.*

- [cppreference](#): Copy elision



# Free Windows 10 development virtual machines for HyperV, Parallels, VirtualBox, and VMWare

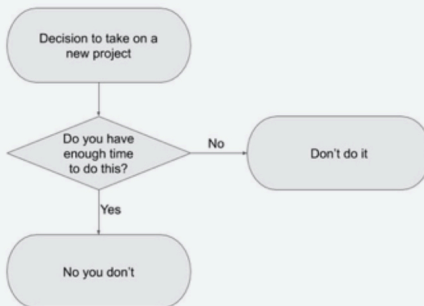
- Scott Hanselman
- Virtual machine downloads at Microsoft
- Free developer tools for Windows 10

## New project flowchart



**Hannah Daly** @HannahEDaly

My husband sent me this 🤔



1d • 07/12/2020 • 10:18 •



Ken Demarest

20 Aug 2009 at 8:50 am PST



Back on Wing Commander 1 we were getting an exception from our EMM386 memory manager when we exited the game. We'd clear the screen and a single line would print out, something like "EMM386 Memory manager error. Blah blah blah." We had to ship ASAP. So I hex edited the error in the memory manager itself to read "Thank you for playing Wing Commander."