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Date: 2024-05-22
Authors: Michael Wong
Project: Programming Language C++, SG19 Machine Learning
Reply to: Michael Wong <michael@codeplay.com>

SG19: Machine Learning virtual Meeting Minutes to 2024/04/11-2024/05/09

Contents

Minutes for 2024/04/11 SG19 Conference Call

On Tue, Apr 9, 2024 at 4:23 PM Michael Wong <fraggamuffin_at_[hidden]> wrote:
> Hi, this SG19 meeting will focus on Stats and Graph
>
> Michael Wong is inviting
> you to a scheduled Zoom meeting.
>
> Topic: SG19 monthly
> Time: 2nd Thursdays 02:00 PM Eastern Time (US and Canada)
> Every month on the Second Thu,
>
>
> Join from PC, Mac, Linux, iOS or Android:
>
> https://iso.zoom.us/j/93084591725?pwd=K3QxZjJlcnljaE13ZWU5cTlLNkx0Zz09
> Password: 035530
>
> Or iPhone one-tap :
> US: +13017158592,,93084591725# or +13126266799,,93084591725#
> Or Telephone:
> Dial(for higher quality, dial a number based on your current location):
> US: +1 301 715 8592 or +1 312 626 6799 or +1 346 248 7799 or +1
> 408 638 0968 or +1 646 876 9923 or +1 669 900 6833 or +1 253 215 8782

> or 877 853 5247 (Toll Free)
> Meeting ID: 930 8459 1725
> Password: 035530
> International numbers available: https://iso.zoom.us/u/agewu4X97
>
> Or Skype for Business (Lync):
> https://iso.zoom.us/skype/93084591725
>
> Agenda:
>
> 1. Opening and introductions
>
> The ISO Code of conduct:
> https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100397.pdf
>
> IEC Code of Conduct:
>
> https://www.iec.ch/basecamp/iec-code-conduct-technical-work
>
> ISO patent policy.
>
>
>
https://isotc.iso.org/livelink/livelink/fetch/2000/2122/3770791/Common_Policy.htm?nodeid=6344764&vernum=-2
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> The WG21 Practices and Procedures and Code of Conduct:
>
> https://isocpp.org/std/standing-documents/sd-4-wg21-practices-and-procedures
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> 1.1 Roll call of participants
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Andrew Lumsdaine, Phil Ratzloff, Bogdan Cyganek, Jens Maurer, Kevin Deweese, Michael Wong, Ozan Irsoy

>
>
> 1.2 Adopt agenda
>
> 1.3 Approve minutes from previous meeting, and approve publishing
> previously approved minutes to ISOCPP.org

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> 1.4 Action items from previous meetings
>
> 2. Main issues (125 min)
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> updates.
>
> 2024 planning
> C++23 and C++26 status
>
https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2023/p1000r5.pdf
Tokyo

- 2024-06-24 to 29: St. Louis, MO, USA
<https://isocpp.org/files/papers/N4966.pdf>; Bill Seymour
[image: ArmsSmall.jpg]
- 2024-11-18 to 23: Wrocław, Poland
<https://isocpp.org/files/papers/N4974.pdf>; Nokia
[image: Nokia_logo_RGB_Bright_blue.png]
- 2025-02-10 to 15: Hagenberg, Austria
<https://isocpp.org/files/papers/N4979.pdf>; University of Applied
Sciences, Upper Austria

>
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> * Dec 12, 2024 02:00 PM ET: Graph
>
>
> ISO meeting status
>
> future C++ Std meetings
>
> 2.2 Paper reviews
> Review BSI Graph feedback:
>
Review itemized objections from all sources from Phil's notes 10-apr-2024
#1,2 need clarity when oliver is here
#4 Get the definition right in new paper
#6 electrical circuit example, will replace
#7investigate visitors, coroutines may be novel (why?), but there are generators now in C++23
What is the constexpr idea? Compile time graph?
mention in scope section whether constexpr is in/out?
std::vector may be better then in_place_vector
#8 load_api takes an istream? a range set of edges with projection function that would be loaded into the graph

Jens comments:
size is on par with mdspan

C++26?
new volume of papers to review
investigations that are uncertain
in/out of LEWG in one meeting?
backlog already in the pipeline for LWG
backup deadline after 26 in 2027

Sg19 Tokyo comments:
Guy: on concept names and novel approach. Exposition only

Will hold F2F in St. Louis and Andrew likely will be there.

implementation?

Andrew comments/concerns:
1. edge list

2. some are TBD
3. Philosophy of concepts
4. cant do BFS on vector of vectors, just compose standard library containers and pass into algorithms **** we can do that now
5. some concepts were over constraining, now is not the case
6. existence proofs basic exaample should just work, e.g. kevin bacon, how they relate to sparse matrix/rectangular, page ranks, structurally bipartite, a requirement not a concept, a join
7. rectangular graph
8. join
some is in 3127

Next meeting in May
1. expanded list of issues (add andrews issues) put in google doc to share link with everyone
2. terms/definition paper which will be bikeshed
3. BGL comparison

Try to vote out for June St. Louis F2F meeting, may be a subset

> As Oliver (Rosten) said "The basic premise is important, and it would be
> fantastic to have support for graphs in the standard."
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> The main items identified were:
> Oliver:
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https://docs.google.com/document/d/1OpH-xxRri7tJTtJJIZTYmSHkkrZJkdBwm9zJ7LqolfQ/edit?usp=sharing
>
>
>
>
> P1709R3:
>
>
https://docs.google.com/document/d/1kLHhbSTX7j0tPeTYECQFSNx3R35Mu3xO5_dyYdRy4dM/edit?usp=sharing
>
>
>
https://docs.google.com/document/d/1QkfDzGyfNQKs86y053M0YHOLP6frzhTJqzg1Ug_vkkE/edit?usp=sharing
>
> <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2020/p2119r0.html>
>
> <

>
>
https://docs.google.com/document/d/175wIm8o4BNGti0WLq8U6uZORegKVjmnpfc-_E8PoGS0/edit?ts=5fff27cd#heading=h.9ogkehmdmtel
> *>*
>
> Array copy semantics:
> array copy-semantics paper P1997 "Relaxing Restrictions on Arrays",
> https://wg21.link/p1997
>
> Stats feedback:
>
> P2376R0
> <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2021/p2376r0.pdf>
> Comments
> on Simple Statistical Functions (p1708r4): Contracts, Exceptions and
> Special cases Johan Lundberg
>
> 2.2.1.2 Reinforcement Learning Larry Lewis Jorge Silva
>
> Reinforcement Learning proposal:
>
> 2.2.1.3 Differential Calculus:
>
>
>
https://docs.google.com/document/d/175wIm8o4BNGti0WLq8U6uZORegKVjmnpfc-_E8PoGS0/edit?ts=5fff27cd#heading=h.9ogkehmdmtel
>
> 2.2.1.4: Stats paper
>
> P2681R0
> <https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2022/p2681r0.pdf>
> More
> Stats Functions Richard Dosselmann, Michael Wong
> Current github
>
> https://github.com/cplusplus/papers/issues/475
>
> https://github.com/cplusplus/papers/issues/979
>

> Stats review Richard Dosselman et al
>
> http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2021/p1708r4.pdf
>
> Feedback from Johan Lundberg and Oleksandr Korval
>
> https://isocpp.org/files/papers/D2376R0.pdf
>
> P1708R3: Math proposal for Machine Learning: 3rd review
>
> PXXXX: combinatorics: 1st Review
>
> *> std.org/jtc1/sc22/wg21/docs/papers/2020/p1708r2
> <http://std.org/jtc1/sc22/wg21/docs/papers/2020/p1708r2>*
> *> above is the stats paper that was reviewed in Prague*
> *> http://wiki.edg.com/bin/view/Wg21prague/P1708R2SG19
> <http://wiki.edg.com/bin/view/Wg21prague/P1708R2SG19>*
> *>*
> *> Review Jolanta Polish feedback.*
> *> http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2020/p2119r0.html
> <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2020/p2119r0.html>*
>
>
> 2.2.1.4: Matrix paper
>
> 2.2.3 any other proposal for reviews?
>
> 2.3 Other Papers and proposals
>
> P1416R1: SG19 - Linear Algebra for Data Science and Machine Learning
>
>
https://docs.google.com/document/d/1IKUNiUhBgRURW-UkspK7fAAyIhfXuMxjk7xKikK4Yp8/edit#heading=h.tj9hitg7dbtr
>
> P1415: Machine Learning Layered list
>
>
https://docs.google.com/document/d/1elNFdIXWoetbxjO1OKol_Wj8fyi4Z4hogfj5tLVSj64/edit#heading=h.tj9hitg7dbtr
>

> 2.2.2 SG14 Linear Algebra progress:
> Different layers of proposal
>
>
https://docs.google.com/document/d/1poXfr7mUPovJC9ZQ5SDVM_1Nb6oYAXlK_d0ljdUAtSQ/edit
>
> 2.5 Future F2F meetings:
>
> 2.6 future C++ Standard meetings:
> https://isocpp.org/std/meetings-and-participation/upcoming-meetings
>
> None
>
> 3. Any other business
>
> New reflector
>
> http://lists.isocpp.org/mailman/listinfo.cgi/sg19
>
> Old Reflector
> https://groups.google.com/a/isocpp.org/forum/#!newtopic/sg19
> <https://groups.google.com/a/isocpp.org/forum/?fromgroups=#!forum/sg14>
>
> Code and proposal Staging area
>
> 4. Review
>
> 4.1 Review and approve resolutions and issues [e.g., changes to SG's
> working draft]
>
> 4.2 Review action items (5 min)
>
> 5. Closing process
>
> 5.1 Establish next agenda
>
>
> 5.2 Future meeting
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>
> IEC Code of Conduct:

>
> https://www.iec.ch/basecamp/iec-code-conduct-technical-work
>
> ISO patent policy.
>
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>
https://isotc.iso.org/livelink/livelink/fetch/2000/2122/3770791/Common_Policy.htm?nodeid=6344764&vernum=-2
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Phil Ratzloff, Ozan Irsoy, Richard Dosselmann, Michael Wong, Scott McMillan, Boguslaw Cyganek, Nathan Owen, Guy Davidson

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> C++23 and C++26 status
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St. Louis Mailing deadline is May 22
Cppcon deadline May 19
St. Louis bookings: Andrew, Michael

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> ISO meeting status
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> future C++ Std meetings
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> 2.2 Paper reviews
>
Graph paper:
20240509
Load API: 4 fns, we never liked it so we removed it from the container interface, then need to add constructors for compressed graph, as they play a dual role (with load, then we need constructors)
then partition id fn need to take vertex id instead of ref
Added section 4 on compressed_graph container on how its diff from CSR

code demo on Fijstra visitor test with coroutines vs visitors
but coroutines cant be constexpr
which ones to support?
need benchmarks?
do both? or do visitors then add coroutines as an addition in the future?

> Review BSI Graph feedback:
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> P1709R3:
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>
https://docs.google.com/document/d/1kLHhbSTX7j0tPeTYECQFSNx3R35Mu3xO5_dyYdRy4dM/edit?usp=sharing
>
>
>
https://docs.google.com/document/d/1QkfDzGyfNQKs86y053M0YHOLP6frzhTJqzg1Ug_vkkE/edit?usp=sharing
>
> <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2020/p2119r0.html>
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> <
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>
https://docs.google.com/document/d/175wIm8o4BNGti0WLq8U6uZORegKVjmnpfc-_E8PoGS0/edit?ts=5fff27cd#heading=h.9ogkehmdmtel
> *>*
>
> Array copy semantics:
> array copy-semantics paper P1997 "Relaxing Restrictions on Arrays",
> https://wg21.link/p1997
>
> Stats feedback:

>
> More stats P2681 never presented
LEWG for P1708R9 in tokyo SG6 approved, LEWG.
14/4/5/0/1
Strongly Against: Maybe The technical nature of the library because implementer of the standard do not have the background in stats
Reference ISO, then it could mute the argument from Walter.B and David S
https://en.cppreference.com/w/cpp/numeric/special_functions

The Mathematical Special Functions library was originally part of Library TR1 ISO/IEC TR 19768:2007, then published as an independent ISO standard, ISO/IEC 29124:2010, and finally merged to ISO C++ as of C++17.

See Mathematical special functions <https://en.cppreference.com/w/cpp/experimental/special_functions> for the ISO/IEC 29124:2010 version of this library.
No wording, once worded

use Online browsing ISO documents: for terms and definitions
https://www.iso.org/obp/ui/#

P2376R0
> <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2021/p2376r0.pdf>
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> 2.2.1.2 Reinforcement Learning Larry Lewis Jorge Silva
>
> Reinforcement Learning proposal:
>
> 2.2.1.3 Differential Calculus:
>
>
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>

> 2.2.1.4: Stats paper
>
> P2681R0
> <https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2022/p2681r0.pdf>
> More
> Stats Functions Richard Dosselmann, Michael Wong
> Current github
>
> https://github.com/cplusplus/papers/issues/475
>
> https://github.com/cplusplus/papers/issues/979
>
> Stats review Richard Dosselman et al
>
> http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2021/p1708r4.pdf
>
> Feedback from Johan Lundberg and Oleksandr Korval
>
> https://isocpp.org/files/papers/D2376R0.pdf
>
> P1708R3: Math proposal for Machine Learning: 3rd review
>
> PXXXX: combinatorics: 1st Review
>
> *> std.org/jtc1/sc22/wg21/docs/papers/2020/p1708r2
> <http://std.org/jtc1/sc22/wg21/docs/papers/2020/p1708r2>*
> *> above is the stats paper that was reviewed in Prague*
> *> http://wiki.edg.com/bin/view/Wg21prague/P1708R2SG19
> <http://wiki.edg.com/bin/view/Wg21prague/P1708R2SG19>*
> *>*
> *> Review Jolanta Polish feedback.*
> *> http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2020/p2119r0.html
> <http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2020/p2119r0.html>*
>
>
> 2.2.1.4: Matrix paper
>
> 2.2.3 any other proposal for reviews?
>
> 2.3 Other Papers and proposals

>
> P1416R1: SG19 - Linear Algebra for Data Science and Machine Learning
>
>
https://docs.google.com/document/d/1IKUNiUhBgRURW-UkspK7fAAyIhfXuMxjk7xKikK4Yp8/edit#heading=h.tj9hitg7dbtr
>
> P1415: Machine Learning Layered list
>
>
https://docs.google.com/document/d/1elNFdIXWoetbxjO1OKol_Wj8fyi4Z4hogfj5tLVSj64/edit#heading=h.tj9hitg7dbtr
>
> 2.2.2 SG14 Linear Algebra progress:
> Different layers of proposal
>
>
https://docs.google.com/document/d/1poXfr7mUPovJC9ZQ5SDVM_1Nb6oYAXlK_d0ljdUAtSQ/edit
>
> 2.5 Future F2F meetings:
>
> 2.6 future C++ Standard meetings:
> https://isocpp.org/std/meetings-and-participation/upcoming-meetings
>
> None
>
> 3. Any other business
>
> New reflector
>
> http://lists.isocpp.org/mailman/listinfo.cgi/sg19
>
> Old Reflector
> https://groups.google.com/a/isocpp.org/forum/#!newtopic/sg19
> <https://groups.google.com/a/isocpp.org/forum/?fromgroups=#!forum/sg14>
>
> Code and proposal Staging area
>
> 4. Review

>
> 4.1 Review and approve resolutions and issues [e.g., changes to SG's
> working draft]
>
> 4.2 Review action items (5 min)
>
> 5. Closing process
>
> 5.1 Establish next agenda
>
>
> 5.2 Future meeting
> * Jan 11, 2024 02:00 PM ET: Graph DONE
> * Feb 8, 2024 02:00 PM ET: Graph DONE
> * Mar 14, 2024 02:00 PM ET: Cancelled due to Tokyo 3-18-23
> * Apr 11, 2024 02:00 PM ET: Stats/Graph DONE
> * May 9, 2024 02:00 PM ET: Graph
> * June 13, 2024 02:00 PM ET: Cancelled; St.louis 6-24-29
> * July 11, 2024 02:00 PM ET: Stats
> * Aug 15, 2024 02:00 PM ET: Graph
> * Sep 12, 2024 02:00 PM ET: CPPCON Sept 15-20 so cancelled
> * Oct 10, 2024 02:00 PM ET: Stats
> * Nov 14, 2024 02:00 PM ET: Cancelled Wroclaw F2F
> * Dec 12, 2024 02:00 PM ET: Graph