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Project: Programming Language C++, SG19 Machine Learning
Reply to: Michael Wong <michael@codeplay.com>

SG19: Machine Learning virtual Meeting Minutes to 2023/07/13

Contents

Minutes for 2023/07/13 SG19 Conference Call

On Thu, Jul 13, 2023 at 3:53 AM Guy Davidson via SG19 <sg19_at_[hidden]> wrote:

> I WILL be attending, and I also agree that we should be making use of
> std::expected, so I will defend that point. I think this is in fact a BSI
> position, but I would need to check with the chair (CCed). If not, we
> should raise this at the BSI meeting on Monday.
>
>
>
> Cheers,
> G
>
>
>
> *From:* SG19 <sg19-bounces_at_[hidden]> *On Behalf Of *Oliver Rosten
> via SG19
> *Sent:* Wednesday, July 12, 2023 9:13 AM
> *To:* sg19_at_[hidden]
> *Cc:* Oliver Rosten <oliver.rosten_at_[hidden]>
> *Subject:* Re: [SG19] SG19 July 13 call
>
>
>

> Hi all,
>
>
>
> Sorry but I can't make the session tomorrow.
>
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>
> However, I am keen to keep advocating for error-handling via a
> std::expected (with an appropriate unexpected value type which captures the
> various possibilities). I think this is the most ergonomic and least
> surprising approach.
>
>
>
> Even if it is decided not to go down this route, I think the paper would
> greatly benefit from a proper discussion of the various options. All I can
> find (sorry if I've missed something) is this bullet point in the R5
> revision list:
>
> - stats_error, an exception, is removed, since (C++) math funtions do
> not throw exceptions
>
> Oliver
>
>
>
> On Wed, 12 Jul 2023 at 04:39, Michael Wong via SG19 <sg19_at_[hidden]>
> wrote:
>
> Hi all, SG19 Machine Learning meeting will focus on Stats. We still want
> to drive graphs and stats to completion. Are there any other suggested
> topics?
> Thank you.
>
>
> Michael Wong is inviting
> you to a scheduled Zoom meeting.
>
> Topic: SG19 monthly
> Time: 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
>
> The WG21 Practices and Procedures and Code of Conduct:

>
> https://isocpp.org/std/standing-documents/sd-4-wg21-practices-and-procedures
>
> 1.1 Roll call of participants
>
> Phil Ratzloff

Boguslaw Cyganek
Rene Morell
Richard Dosselmann
Nathan Owen
Michael Wong
Luke D'Alessandro
ozan Irsoy
Scott McMillan
Jens Maurer

> 1.2 Adopt agenda
>
> 1.3 Approve minutes from previous meeting, and approve publishing
> previously approved minutes to ISOCPP.org
>
> 1.4 Action items from previous meetings
>
> 2. Main issues (125 min)
>
> 2.1 General logistics
>
> Meeting plan, focus on one paper per meeting but does not preclude other
> paper updates:
> cppcon Oct 1
>
>

> Varna F2F
>
> C++23 and C++26 status
>
>
> Apr 13: Graph

> May 11: Cancelled
> June 15: Varna F2F (cancelled)
> July 13: Stats
> Aug 10: Matrix
> Sep 14: Graph
> Oct 12: Stats
> Nov 9: Kona F2F Cancelled
> Dec 14: Matrix
>
>
> ISO meeting status
>
> future C++ Std meetings
>
> 2.2 Paper reviews
>
> 2.2.1: ML topics
>
> 2.2.1.1 Graph Proposal Phil Ratsloff et al
>
> Latest paper:
>
> Here's a link to the paper (different than the previous paper reviewed).
> There are some additional updates I'm planning on making before the
> meeting.
>
>
>
https://docs.google.com/document/d/1OpH-xxRri7tJTtJJIZTYmSHkkrZJkdBwm9zJ7LqolfQ/edit?usp=sharing
>
>
> will do more work on it,

>
>
> 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
>
> R2:

use longer names of statistics
Accumulator objects are independent of the range its drawing values with on invocation
is_convertible_v replaced by common_type_t
5.1 header should be called statistics
5.2.1 have both modes_... and modes_...
accumulator store both a T and a comp, how to make trivially copyable (make it conditional on T and comp)
dont use trailing return type when it is a basic type T, just put it in front
O and comp can be deduced and T cannot? use CTAD if you can; not sure if you can use CTAd with partial class template id? No that is not standard
FWIW, partial CTAD was proposed in https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2022/p1021r6.html, but was removed in R2 “following EWG guidance”. I don’t think I’ve seen it come up again.

switch T and weight in weighted_modes_accumulator
is there a way to say previous X is less then current x: can say w is weight corresponding to X, say successive invocations of operator () invoked by the comparator X ...

Why is trailing return of T and O? I combined return of single mode and plural modes. This needs an overload set
These are different classes? can u implement normal mode with weighted mode? weights need to sum to 1
5.2.1 break each class into separate descriptions
Why is W a template argument not a typedef? So I can customise it as a user
plural classes should be separate from singular classes
WHy fresh signature for statistics_accumulate , but a zip view is a range
if the value type is a tuple , then decompose the tuples into individual arguments for your functionl use an apply on that tuple when you actually invoke the accumulator object
user wont know by looking at the call what the range is
apply is already variadic
weight comes from 5.2.4 range of weights, it is regular

if it returns a tuple-like it will decompose
add prose explaining this design that you opted to decompose in the stats accumulator function and not in each accumulator
std apply only work for std:types? so we are limiting the API to ranges that produce
5.3.1 percentile does not say sorted/unsorted anymore
why a separate template argument alloc, it already knows how to allocate itself

5.3.3 do we want to keep independent input ranges
accumulator are more generic then calling a covariant function where I know I am comparing 2 input ranges
no potential for variadic, just 2
so dont create a zip type
so factor to separate ranges

Unanimously approved to
Exit SG14 to go to SG6

why Expected : the other arithmetic types dont use it so we dont use it, we dont do exceptions with math

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
>
> ready for LEWG review

>
>
> 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-UkspK7fAAyIhfXuMxjk7xKik
K4Yp8/edit#heading=h.tj9hitg7dbtr
>
> P1415: Machine Learning Layered list
>
>
https://docs.google.com/document/d/1elNFdIXWoetbxjO1OKol_Wj8fyi4Z4hogfj5tLVSj
64/edit#heading=h.tj9hitg7dbtr
>
> 2.2.2 SG14 Linear Algebra progress:
> Different layers of proposal
>
>
https://docs.google.com/document/d/1poXfr7mUPovJC9ZQ5SDVM_1Nb6oYAXIK_d0

ljdUAtSQ/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
> Apr 13: Graph
> May 11: Cancelled
> June 15: Varna F2F (cancelled)
> July 13: Stats
> Aug 10: Matrix
> Sep 14: Graph
> Oct 12: Stats

> Nov 9: Kona F2F Cancelled
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