Math Special Interest Group

July 31, 2024

Agenda

- Overview of ArrayFire with a focus on math functions - Umar Arshad (Intel)
- Updates from last meeting - Sarah Knepper
  - oneMKL Specification
  - oneMKL Interfaces Open Source Project
  - oneMKL Interface Domain Split Proposal

oneMKL Specification

Recent updates:

- Sparse BLAS API was updated (#522)
- Various fixes in RNG, BLAS, DFT, etc.

Open PRs:

- #542: [spblas] Restrict features not supported by any backends
- #556: [spblas] Require same memory kind for alpha and beta parameters
- #557: [RNG] Extend parameter type for random distributions
- #559: [RNG] Add Beta, Gamma distributions to Device API

oneMKL Interfaces Open Source Project

- Great progress made on open source checklist work package
  - Build documentation rewritten
  - Lead maintainers identified (oneMKL-{domain}-write, oneMKL-maintain)
- GitHub Actions workflow to run unit tests for Intel oneMKL backend on CPU were enabled
- Modifications to DFT domain to reflect specification
- [WIP] Support for cuSPARSE, rocSPARSE backends
- [WIP] Update to Intel oneMKL backends to match new sparse API

oneMKL Interface Domain Split Proposal

- A proposal to split oneMKL interfaces into separate repos by domain was discussed at the June 25 Open Source Working Group meeting (notes)
  - Aimed to make project more modular
- Consensus formed to move forward with further discussion (especially about implementation details)
- An RFC will be made for comments

Resources

- Unified Acceleration Foundation: https://uxlfoundation.org/
- GitHub for UXL Foundation: https://github.com/uxlfoundation/foundation
- Latest release of oneMKL Spec (currently 1.3): https://oneapi-spec.uxlfoundation.org/specifications/oneapi/v1.3-rev-1/elements/onemkl/source/
- GitHub for oneAPI Spec: https://github.com/uxlfoundation/oneAPI-spec
- GitHub for open source oneMKL interfaces (currently BLAS, RNG, LAPACK, DFT, and sparse BLAS domains): https://github.com/oneapi-src/oneMKL
- UXL Foundation Slack #sig-math #onemkl channels