Christian R. Trott

Performance Portability for Linear Algebra with Kokkos

1515 Eubank SE
Albuquerque
NM 87123
crtrott@sandia.gov
H. Carter Edwards

Supporting high concurrency node architectures is most likely one of the defining challenges of the next few years not just for linear algebra libraries, but for scientific applications in general. A particular problem is how to support the different node architectures used in upcoming super computers, without writing multiple code implementations. Sandia's answer to address this issue is Kokkos, a programming model and its implementation as an embedded C++ library, which provides abstractions for parallel dispatch as well as managing hierarchical memory effectively.

In this talk we will present the fundamental design and capabilities of Kokkos, and demonstrate its usage to implement performance portable linear algebra operations for the scientific library collection Trilinos. We will also show results from performance studies across multiple architectures including the prototype systems for upcoming super computers using Intel Xeon Phi processors and IBM Power processors with NVIDIA GPUs attached.