Confirmation of Participation

Sajjad Azizi

took part in the online course

Introduction to oneAPI, SYCL2020 and OpenMP offloading

held at the High-Performance Computing Center Stuttgart (HLRS) from September 23-25, 2024 and attended lectures and exercises on the following topics:

- oneAPI — Introduction to a mixed Architecture Development Environment
  - Motivation and oneAPI Standardization
  - Intel's oneAPI Toolkits Portfolio and Components
  - Intel oneAPI plug-ins for Nvidia and AMD hardware
- Direct programming with oneAPI compilers
  - Introduction to the heterogeneous programming model with SYCL 2020
  - SYCL features and examples
    - Device selection
    - Execution model
    - Compilation and execution flow
    - Memory model; buffers, Unified Shared Memory (USM)
    - Performance optimizations
- oneAPI Case Study – GROMACS
- Introduction to the Intel Tiber Developer Cloud
- Programming for AI workloads with software development tools powered by oneAPI
  - AI Frameworks (IDP, PyTorch, TensorFlow)
  - oneDNN, oneCCL
  - SYCLomatic code migration tool
  - How to compile SYCL kernels using PyTorch
  - Migrating AI workload from CUDA to SYCL
  - Demo: llama.cpp code migration
- Intel OpenMP for offloading for Fortran
- Intel oneAPI libraries (oneMKL) for HPC
- Portable SYCL code using oneMKL on AMD, Intel, and Nvidia GPUs
- Intel Debugging Tools for heterogeneous programming (CPU, GPU)
- Programming for Distributed HPC Systems using Intel MPI
- Application profiling for CPU and/or mixed hardware with Intel VTune™
- Intel VTune™ Profiler examples from cookbook
- Application profiling for CPU and mixed hardware with Intel Advisor™

Lectures and training sessions were provided by

- Pascal Bähr, Rafal Bielski, Heinrich Bockhorst, Sneha Chattopadhyay, Gennady Fedorov, Tobias Kloeffel, Rafael Lago, Stefana Raileanu, Alina Shadrina, Igor Vorobtsov (Intel),
- Andrey Alekseenko (KTH, Sweden).

Stuttgart, September 25, 2024

Höchstleistungsrechenzentrum
Universität Stuttgart
Nobelstraße 19
70569 Stuttgart
Germany

Tobias Haas
Course organizer