Intel oneAPI Workshop- Agenda
CERFACS (TOULOUSE) 28-29-30 Mars 2023

JOUR 1 – THEME: PROGRAMMATION avec ONEAPI

Time	Session name / description	Presenter
09:30	Accueil et mot de bienvenue	
09:40	Introduction à OneAPI • Hardware Evolution: From CPUs to heterogenous HW (GPUs, FPGAs) programming • Concept and purpose for the oneAPI Standardization initiative	*Vladimir Kostarev*
10:00	Introduction à Intel oneAPI Toolkits et l'infrastructure DevCloud • Intel's oneAPI Solutions – Toolkits with Compilers, libs, analysis and migration tools • Transition from Intel Parallel Studio XE to Intel oneAPI toolkits • Dev Cloud, Public available development Sandbox	*Stephen Blair-Chappell*
10:30	Pause café	
11:00	Présentation de DPC++/SYCL • Intro to heterogenous programming model with SYCL 2020 • SYCL features and examples. • "Hello World" Example • Device Selection • Execution Model • Compilation and Execution Flow • Memory Model; Buffers, Unified Shared Memory (USM) • Performance optimizations with SYCL features	*Joel Falcou & Stephen Blair-Chappell*
12:30	Pause déjeuner	
14:00	Travaux pratiques sur programmation CPU/GPU avec SYCL	
15:15	Pause café	
15:45	Travaux pratiques sur programmation CPU/GPU avec SYCL (cont)	
16:30	Fin de la journée 1	

The agenda topics and timing are subject to change.

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Jour 2 – THEME: BIBLIOTHEQUES et OUTILS de PROFILAGE

Time	Session name / description	Presenter
09:30	Accueil et mot de bienvenue	
09:40	Review of DAY 1	*Stephen Blair-Chappell*
10:00	Présentation des Librairies Intel oneAPI libraries (oneMKL) for HPC - with demos Performance optimized libraries for numerical simulations and other purposes	*Joel Falcou*
10:30	Pause café	
11:00	Compatibility Tool (CUDA / SYCL conversion) Open-Source Compatibility tool for porting purposes (SYCLomatic) - with demo Migration Cuda based GPU Applications to SYCL	*Joel Falcou*
11:30	Profilage et analyse des performances des codes à l'aide de Vtune/ Advisor The Intel® Advisor is a tool to help design and optimize high-performing code for modern computer architectures. Each chapter in the Intel® Advisor Cookbook contains step-by-step instructions to help effectively use more cores, vectorization, or heterogeneous processing using Intel Advisor.	*Stephen Blair-Chappell*
12:30	Pause déjeuner	
14:00	Travaux pratiques sur l'utilisation de CUDA to SYCL Compatibility Tool	
15:15	Pause café	
15:45	Travaux pratiques optimisation des codes	
16:30	Fin de la journée 2	

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Jour 3 – THEME: MPI, openMP offloading et FORTRAN

Time	Session name / description	Presenter
09:30	Accueil et mot de bienvenue	
09:40	Intel Fortran compilers – Ifort and IFX IFX 2023 Overview Getting Started and Porting from IFORT to IFX IFX OpenMP Features	*Stephen Blair-Chappell*
10:00	Offloading with FORTRAN Code – with Demos Automatic offloading using DO CONCURRENT Offloading using OpenMP Offloading using oneMKL	Soner Steiner
10:30	Pause café	
11:00	Intel® MPI in Heterogenious Environment Offloading using OpenMP Intel MPI functionalities for GPU	Soner Steiner
11:30	More on OpenMP offloading (C/C++) An Example project using Lammps	*Stephen Blair-Chappell*
12:30	Pause déjeuner	
14:00	Travaux pratiques optimisation des codes	
15:15	Pause café	
15:45	Travaux pratiques optimisation des codes	
16:30	Fin de la journée 3	

Note: Agenda topics are subject to change.

Les présentations seront délivrées en Français ou en Anglais selon l'instructeur.

Les Instructeurs
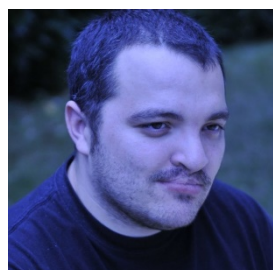
Joel Falcou is an associated professor at the University Paris-Saclay and researcher at the Laboratoire de Recherche d'Informatique in Orsay, France. His research focuses on studying generative programming idioms and techniques to design tools for parallel software development.

The main parts of his work are:

- the exploration of Embedded Domain Specific Language design for parallel computing on various architectures.
- the definition of a formal framework for reasoning about meta-programs.

He is also the founder and training advisor of CODE RECKONS.

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Stephen Blair-Chappell is an independent software consultant and is an Intel-certified oneAPI instructor. He was formerly the Technical Director at Bayncore where he led a team of consultants providing HPC and AI training on Intel Architecture. For 18 years he was a Technical Consulting Engineer at Intel helping their strategic customers in software optimization and code modernization.   He is the author of the book "Parallel Programming with Intel Parallel Studio XE".

Soner Steiner is an HPC, HPDA, and IA specialist at Vienna Scientific Cluster (VSC) and is involved in the EuroCC-Austria project (a European network for awareness creation, consultancy, and training in HPC). He has 5 years of teaching experience at the university level (University of Applied Science, Austria-Wiener Neustadt). At VSC he is involved in training and consultancy of academia and industry. Before his role at the VSC, he was involved for several years in computational material science. And he is freshly a certified Intel oneAPI instructor in DPC++ essentials, OpenMP offload basics, and ML using oneAPI.

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