IWOCL SYCLcon

10 Years of IWOCL and SYCLcon

A decade of breakthroughs, but is the best yet to come?

10 years of IWOCL / SYCLcon history!

- I first saw a demo of OpenCL running across a range of hardware at IEEE/ACM SuperComputing in November 2009
- Where I met Dr Ben Bergen from Los Alamos National Laboratory who was running the demo
- Over the next couple of years we talked about how there was no formal place for the OpenCL community to meet
- This led to a meeting at Los Alamos on May 8th 2012 where we came up with the idea for a new workshop for the OpenCL community, and IWOCL / SYCLcon was born!



The first workshop was organized in a rush...

Georgia Tech, May 14th 2013 40 attendees, 11 speakers

Technology Square







Toronto 2017

4.0

Stanford 2015

Boston 2019

Vienna

2016

Oxford 2018

TILES

Some IWOCL / SYCLcon statistics

Over 900 total delegates

219 accepted submissions

~32,700 downloads and counting... (dl.acm.org)



Cool disclosures at IWOCL / SYCLcon

- New versions of the SYCL and OpenCL standards
- New tools such as OCLgrind, profilers, debuggers, ...
- New uses of the standards: C++ AMP on OpenCL, ported applications such as GROMACS, optimized math libraries, machine learning frameworks, Boost, medical imaging, interactive raytracing, autonomous vehicles, drug discovery pipelines, safety critical implementations, ...
- **Best practice** for using the standards across CPUs, GPUs, FPGAs and other accelerators





Nano Simbox: An OpenCL-accelerated Framework for Interactive Molecular Dynamics M. O'Connor, P. Tew, B. Sage, S. McIntosh-Smith, D. R. Glowacki, IWOCL 2015, Stanford





Rapid Prototyping With Combined Scientific CFD Simulation and Real Time Raytracing Implementation in OpenCL, Moritz Lehmann, University of Bayreuth, IWOCL 2022

OpenCL and SYCL mentions in academic papers



Papers mentioning parallel programming languages. Data according to Google Scholar (May 10th 2022)



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https://uob-hpc.github.io

OpenCL
OpenMP
MPI
CUDA
Cilk
TBB
OpenACC
SYCL

Papers mentioning parallel programming languages. Data according to Google Scholar (May 10th 2022)





Cumulative papers mentioning parallel programming languages. Data according to Google Scholar (May 10th 2022)





What about the next 10 years?

- Many more advances still to come!
- Heterogeneous computing is becoming ubiquitous
 - Has been for some time in embedded computing
 - In HPC, most Exascale supercomputers will be CPU+GPU
- More heterogeneity lots of different accelerators!
- SYCL growing rapidly and being adopted in AI, autonomous vehicles, safety critical systems etc.





IWOCL & SYCLcon 2022

For more information: IWOCL / SYCLcon: https://www.iwocl.org/ Khronos OpenCL: https://www.khronos.org/opencl/ Bristol HPC group: https://uob-hpc.github.io/ S.McIntosh-Smith at bristol.ac.uk **Email: Twitter:** @simonmcs