ATPESC 2022 – Hardware Track

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SURGE OF SCIENTIFIC MACHINE LEARNING

Simulations/ surrogate models
- Replace, in part, or guide simulations with AI-driven surrogate models

Data-driven models
- Use data to build models without simulations

Co-design of experiments
- AI-driven experiments

Design infrastructure to facilitate and accelerate AI for Science applications
INTEGRATING AI SYSTEMS IN FACILITIES

Experimental Facility

Al-Edge accelerator

Computing Facility

AI-Accelerators

Simulations

Data-driven Models
AI FOR SCIENCE APPLICATIONS

Cancer drug response prediction

Protein-folding (Image: NCI)

Imaging Sciences-Braggs Peak

Tokomak Fusion Reactor operations

and more..
ML HARDWARE

Cerebras (CS-2)  SambaNova

Graphcore  Groq

Habana
AGENDA – MONDAY, AUGUST 1, 2022

8:00AM Speaker check-in

8:30AM Vitali Morozov, ALCF: Introduction to Track 1 – Hardware Architectures

9:00AM Tom Papatheodore (papatheodore@ornl.gov)
   The Oak Ridge Leadership Computing Facility's Summit & Frontier Supercomputers

9:30AM Samantika Sury (s.sury@samsung.com):
   Memory Coupled Compute: Innovating the future of HPC and AI

10:00AM Break – 30 minutes

10:30AM Andrew Ling (aling@groq.com):
   Software-defined Machine Learning with Groq's Tensor Streaming Processor

11:00AM Milind S Pandit (mpandit@habana.ai): Training Deep Learning Models on Habana Gaudi

11:30AM Urmish Thakkar (urmish.thakker@sambanovasystems.com):
   SW/HW Innovations in Emerging DL Training Systems

12:00PM Richard Bohl (richardb@graphcore.ai): Graphcore IPUs: Accelerating Argonne's ML/AI Applications

12:30PM Lunch in cafeteria – 1 hour

Argonne Leadership Computing Facility
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12:30PM Lunch in cafeteria – 1 hour

1:30PM Andy Hock (andy@cerebras.net): Accelerating AI and HPC for science at wafer-scale with Cerebras Systems

2:00PM Servesh Muralidharan (servesh@anl.gov)
   An overview of Argonne’s Aurora Exascale Supercomputer and its Programming Models,

2:30PM Keith D. Underwood (keith.underwood@hpe.com):
   Considerations for programming Slingshot at scale

3:00PM Yuri Alexeev (yuri@alcf.anl.gov): Quantum computing trends

3:30PM Break - 30 minutes

4:00PM Q/A to all presenters – 1 hour

5:00PM Demos - Graphcore

6:30PM Dinner in cafeteria

7:30PM ATPESC after-dinner talk
QUESTION AND ANSWER SESSION: 4 PM

Quick question –

please, ask after the talk

Long question or a discussion –

please, send to Vitali Morozov (morozov@anl.gov)