Session Program

Oct 3 – 6, 2022

Fast Machine Learning for Science Workshop 2022

Contributed Talks

Southern Methodist University

Sun, October 2

1:45 PM

Contributed Talks: Contributed Talks

Session | **Location:** Southern Methodist University

13:45 – 14:00

Designing intelligent DAQ systems for radiation instrumentation with hls4ml

Speaker
Prof. Audrey Corbeil Therrien

14:00 – 14:05

Design and first test results of a reconfigurable autoencoder on an ASIC for data compression at the HL-LHC

Speaker
Danny Noonan

14:05 – 14:10

Increasing the LHC Computational Power by integrating GPUs as a service

Speakers
William Patrick Mccormack, Yongbin Feng

14:10 – 14:15

Exa.TrkX inference as-a-service

Speaker
Yongbin Feng

14:15 – 14:30

Quantized ONNX (QONNX)

Speaker
Jovan Mitrevski

14:30 – 14:45

Accelerating JEDI-net for jet tagging on FPGAs

Speaker
Zhiqiang Que

14:45 – 15:00

Implementation of a pattern recognition neural network for live reconstruction using AI processors

Speaker
Patrick Schwaebig

15:00 – 15:15

FKeras: A Fault Tolerance Library for DNNs

Speaker
Olivia Weng

3:15 PM

3:45 PM

Contributed Talks: Contributed Talks

Session | **Location:** Southern Methodist University

15:45 – 16:00

Neural network accelerator for quantum control

Speaker
Giuseppe Di Guglielmo

16:00 – 16:15 **End-to-End Vertex Finding for the CMS Level-1 Trigger**

Speakers
Benjamin Radburn-Smith, Christopher Edward Brown

16:15 – 16:30

Resource Efficient and Low Latency GNN-based Particle Tracking on FPGA

Speakers
Bo-Cheng Lai, Shi-Yu Huang

16:30 – 16:45

Neural Signal Compression System for a Seizure-Predicting Brain Implant in CMOS 28nm

Speaker
William Lemaire

16:45 – 17:00

Exploring FPGA in-storage computing for Supernova Burst detection in LArTPCs

Speaker
Benjamin Hawks

17:00 – 17:15

Rapid Generation of Kilonova Light Curves Using Conditional Variational Autoencoder

Speaker
Surojit Saha

5:15 PM

Mon, October 3

1:30 PM

Contributed Talks

Session | **Location:** Southern Methodist University

13:30 – 13:45

Demonstration of Machine Learning-assisted real-time noise regression in LIGO

Speaker
Muhammed Saleem Cholayil

13:45 – 14:00

Rapid Fitting of Band-Excitation Piezoresponse Force Microscopy Using Physics Constrained Unsupervised Neural Networks

Speaker
Alibek Kaliyev

14:00 – 14:05

Data Driven Weather Forecasting with Rudimentary Observables

Speaker
Luke Fairbanks

14:05 – 14:10

Low-latency Noise Subtraction of Gravitational Wave Data by DeepClean

Speaker
Chia-Jui Chou

14:10 – 14:15

Harnessing ultrafast ML for new algorithms at the CMS L1 trigger

Speaker
Daniel Diaz

14:15 – 14:30

Intelligent experiments through real-time AI: Fast Data Processing and Autonomous Detector Control for sPHENIX and future EIC detectors

Speaker
Micol Rigatti

14:30 – 14:45

Application of deep learning to instability tracking using high-speed video cameras in magnetic confinement fusion

Speaker
Mr Yumou Wei

14:45 – 15:00

Fast recurrent neural networks on FPGAs with hls4ml

Speaker
Elham E Khoda

15:00 – 15:15

Deep Neural Network Algorithms in the CMS Level-1 Trigger

Speaker
Anthony Vizcaino Aportela

3:15 PM

3:45 PM

Contributed Talks

Session | **Location:** Southern Methodist University

15:45 – 16:00

Extremely Noisy 4D-TEM Strain Mapping Using Cycle Consistent Spatial Transforming Autoencoders

Speaker
Shuyu Qin

16:00 – 16:15

Quantized Distilled Autoencoder Model on FPGA for Real-Time Crystal Structure Detection in 4D Scanning Transmission Electron Microscopy

Speaker
Ryan Forelli

16:15 – 16:30

Deployment of ML in changing environments

Speakers
Benjamin Radburn-Smith, Christopher Edward Brown, Marco Barbone

16:30 – 16:45

Low-latency Calorimetry Clustering at the LHC with SPVCNN

Speaker
Alexander Joseph Schuy

16:45 – 17:00

CryoAI – Prototyping cryogenic chips for machine learning at 22nm

Speaker
Mr Manuel Valentin

17:00 – 17:15

Next Generation Coprocessors as a service

Speaker
Dylan Sheldon Rankin

5:15 PM

Tue, October 4

1:30 PM

Contributed Talks

Session | **Location:** Southern Methodist University

13:30 – 13:45

A Deep Learning Approach to Particle Identification for the AMS Electromagnetic Calorimeter

Speaker
Raheem Hashmani

13:45 – 14:00

A Normalized Autoencoder for LHC triggers

Speaker
Luigi Favaro

14:00 – 14:05

Interaction Network Autoencoder in the Level-1 Trigger

Speaker
Sukanya Krishna

14:05 – 14:10

Large CNN for HLS4ML and Deepcalo

Speakers
ChiJui Chen, Lin-Chi Yang, Yan-Lun Huang

14:10 – 14:15

End-to-end acceleration of machine learning in gravitational wave physics

Speaker
Alec Gunny

14:15 – 14:30

FastML Science Benchmarks: Accelerating Real-Time Scientific Edge Machine Learning

Speaker
Jules Muhizi

14:30 – 14:45

Robust anomaly detection using NuRD

Speaker
Abhijith Gandrakota

14:45 – 15:00

Quantized Neural Networks on FPGAs using HAWQ-V3 and hl4ml

Speaker
Javier Ignacio Campos

15:00 – 15:15

Implementing Deep Neural Network Algorithms inside the CMS Level-1 Trigger

Speaker
Duc Hoang

3:15 PM

3:45 PM

Contributed Talks

Session | **Location:** Southern Methodist University

15:45 – 16:00 **Real-time image processing for high-resolution imaging detectors**

Speaker
Georgia Karagiorgi

16:00 – 16:05 **Semi-supervised Graph Neural Networks for Pileup Noise Removal**

Speaker
Shikun Liu

16:05 – 16:10
A Machine Learning Software Infrastructure for Gravitational Wave Signal Discovery

Speaker
Ethan Marx

16:10 – 16:15 **Online-compatible Unsupervised Non-resonant Anomaly Detection**

Speaker
Vinicius Massami Mikuni

16:15 – 16:30
In-System Parameter Update and I/O Capture for Machine Learning IP Cores

Speaker
Brett McMillian

16:30 – 16:35 **Detection for Core-collapse Supernova and Fast Data Preprocessing**

Speaker
Andy Chen

16:35 – 16:40 **EMD Neural Network Loss for ECON-T ASIC Autoencoder**

Speaker
Rohan Shenoy

16:40 – 16:45
A novel ML-based method of primary vertex reconstruction in high pile-up condition

Speaker
Haoran Zhao

16:45 – 17:00 **In-Pixel AI: From Algorithm to Accelerator**

Speaker
Priyanka Dilip

17:00 – 17:15 **Autonomous real-time science-driven follow-up of survey transients**

Speaker
Niharika Sravan

5:15 PM