



# Fast Machine Learning for Science Workshop 2022

## Monday, 3 October 2022

### Contributed Talks: Contributed Talks (13:45 - 15:15)

time	[id] title	presenter
13:45	[27] Designing intelligent DAQ systems for radiation instrumentation with hls4ml	Prof. CORBEIL THERRIEN, Audrey
14:00	[41] Design and first test results of a reconfigurable autoencoder on an ASIC for data compression at the HL-LHC	NOONAN, Danny
14:05	[35] Increasing the LHC Computational Power by integrating GPUs as a service	MCCORMACK, William Patrick FENG, Yongbin
14:10	[32] Exa.TrkX inference as-a-service	FENG, Yongbin
14:15	[15] Quantized ONNX (QONNX)	MITREVSKI, Jovan
14:30	[16] Accelerating JEDI-net for jet tagging on FPGAs	QUE, Zhiqiang
14:45	[19] Implementation of a pattern recognition neural network for live reconstruction using AI processors	SCHWAEBIG, Patrick
15:00	[34] FKeras: A Fault Tolerance Library for DNNs	WENG, Olivia

### Contributed Talks: Contributed Talks (15:45 - 17:15)

time	[id] title	presenter
15:45	[8] Neural network accelerator for quantum control	DI GUGLIELMO, Giuseppe
16:00	[6] End-to-End Vertex Finding for the CMS Level-1 Trigger	RADBURN-SMITH, Benjamin BROWN, Christopher Edward
16:15	[18] Resource Efficient and Low Latency GNN-based Particle Tracking on FPGA	LAI, Bo-Cheng HUANG, Shi-Yu
16:30	[43] Neural Signal Compression System for a Seizure-Predicting Brain Implant in CMOS 28nm	LEMAIRE, William
16:45	[11] Exploring FPGA in-storage computing for Supernova Burst detection in LArTPCs	HAWKS, Benjamin
17:00	[44] Rapid Generation of Kilonova Light Curves Using Conditional Variational Autoencoder	SAHA, Surojit

# Tuesday, 4 October 2022

## Contributed Talks (13:30 - 15:15)

time	[id] title	presenter
13:30	[29] Demonstration of Machine Learning-assisted real-time noise regression in LIGO	CHOLAYIL, Muhammed Saleem
13:45	[3] Rapid Fitting of Band-Excitation Piezoresponse Force Microscopy Using Physics Constrained Unsupervised Neural Networks	KALIYEV, Alibek
14:00	[5] Data Driven Weather Forecasting with Rudimentary Observables	FAIRBANKS, Luke
14:05	[24] Low-latency Noise Subtraction of Gravitational Wave Data by DeepClean	CHOU, Chia-Jui
14:10	[17] Harnessing ultrafast ML for new algorithms at the CMS L1 trigger	DIAZ, Daniel
14:15	[14] Intelligent experiments through real-time AI: Fast Data Processing and Autonomous Detector Control for sPHENIX and future EIC detectors	RIGATTI, Micol
14:30	[33] Application of deep learning to instability tracking using high-speed video cameras in magnetic confinement fusion	Mr WEI, Yumou
14:45	[23] Fast recurrent neural networks on FPGAs with hls4ml	KHODA, Elham E
15:00	[67] Deep Neural Network Algorithms in the CMS Level-1 Trigger	APORTELA, Anthony Vizcaino

## Contributed Talks (15:45 - 17:15)

time	[id] title	presenter
15:45	[4] Extremely Noisy 4D-TEM Strain Mapping Using Cycle Consistent Spatial Transforming Autoencoders	QIN, Shuyu
16:00	[2] Quantized Distilled Autoencoder Model on FPGA for Real-Time Crystal Structure Detection in 4D Scanning Transmission Electron Microscopy	FORELLI, Ryan
16:15	[7] Deployment of ML in changing environments	RADBURN-SMITH, Benjamin BROWN, Christopher Edward BARBONE, Marco
16:30	[12] Low-latency Calorimetry Clustering at the LHC with SPVCNN	SCHUY, Alexander Joseph
16:45	[21] CryoAI – Prototyping cryogenic chips for machine learning at 22nm	Mr VALENTIN, Manuel
17:00	[36] Next Generation Coprocessors as a service	RANKIN, Dylan Sheldon

# Wednesday, 5 October 2022

## Contributed Talks (13:30 - 15:15)

time	[id] title	presenter
13:30	[13] A Deep Learning Approach to Particle Identification for the AMS Electromagnetic Calorimeter	HASHMANI, Raheem
13:45	[26] A Normalized Autoencoder for LHC triggers	FAVARO, Luigi
14:00	[37] Interaction Network Autoencoder in the Level-1 Trigger	KRISHNA, Sukanya
14:05	[28] Large CNN for HLS4ML and Deepcalo	CHEN, ChiJui YANG, Lin-Chi HUANG, Yan-Lun
14:10	[30] End-to-end acceleration of machine learning in gravitational wave physics	GUNNY, Alec
14:15	[10] FastML Science Benchmarks: Accelerating Real-Time Scientific Edge Machine Learning	MUHIZI, Jules
14:30	[39] Robust anomaly detection using NuRD	GANDRAKOTA, Abhijith
14:45	[40] Quantized Neural Networks on FPGAs using HAWQ-V3 and hl4ml	CAMPOS, Javier Ignacio
15:00	[68] Implementing Deep Neural Network Algorithms inside the CMS Level-1 Trigger	HOANG, Duc

## Contributed Talks (15:45 - 17:15)

time	[id] title	presenter
15:45	[20] Real-time image processing for high-resolution imaging detectors	KARAGIORGI, Georgia
16:00	[47] Semi-supervised Graph Neural Networks for Pileup Noise Removal	LIU, Shikun
16:05	[69] A Machine Learning Software Infrastructure for Gravitational Wave Signal Discovery	MARX, Ethan
16:10	[9] Online-compatible Unsupervised Non-resonant Anomaly Detection	MIKUNI, Vinicius Massami
16:15	[42] In-System Parameter Update and I/O Capture for Machine Learning IP Cores	MCMILLIAN, Brett
16:30	[46] Detection for Core-collapse Supernova and Fast Data Preprocessing	CHEN, Andy
16:35	[38] EMD Neural Network Loss for ECON-T ASIC Autoencoder	SHENOY, Rohan
16:40	[25] A novel ML-based method of primary vertex reconstruction in high pile-up condition	ZHAO, Haoran
16:45	[45] In-Pixel AI: From Algorithm to Accelerator	DILIP, Priyanka
17:00	[22] Autonomous real-time science-driven follow-up of survey transients	SRAVAN, Niharika