



# 4th Inter-experiment Machine Learning Workshop

## Wednesday, October 21, 2020

### Workshop: Wednesday morning (10:00 AM - 12:55 PM)

-Conveners: **Pietro Vischia; David Rousseau**

time	[id] title	presenter
10:00	[24] GANplifying Event Samples	DIEFENBACHER, Sascha Daniel
10:20	[47] Generative models for calorimeters response simulation - from GANs through VAE to e2e SAE	DEJA, Kamil Rafal
10:40	[10] Reduced Precision Strategies for Deep Learning: 3DGAN Use Case	Mr REHM, Florian
11:00	[80] FastCaloGAN: a tool for fast simulation of the ATLAS calorimeter system with Generative Adversarial Networks	FAUCCI GIANNELLI, Michele
11:05	[27] Estimating Support Size of Distribution Learnt by Generative Adversarial Networks for Particle Detector Simulation	JARUSKOVA, Kristina
11:10	[60] Fast simulation of Time Projection Chamber response at MPD using GANs	MAEVSKIY, Artem
11:15	[64] Domain Adaptation Techniques in Particle Identification for the ALICE experiment	KURZYNKA, Michal
11:20	[62] Black-Box Optimization with Local Generative Surrogates	Mr BELAVIN, Vladislav
11:40	[65] Using Machine Learning to Speed Up and Improve Detector R&D	BOLDYREV, Alexey
12:00	[61] Matrix Element Regression with Deep Neural Networks -- breaking the CPU barrier	BURY, Florian
12:20	[50] Adaptive divergence for rapid adversarial optimization & (1 + epsilon)-class Classification: an Anomaly Detection Method for Highly Imbalanced or Incomplete Data Sets	BORISYAK, Maxim

### Workshop: Wednesday afternoon (2:00 PM - 5:00 PM)

-Conveners: **Simon Akar; Gian Michele Innocenti**

time	[id] title	presenter
2:00 PM	[5] Accelerated pixel detector tracklet finding with Graph Neural Networks on FPGAs	THAIS, Savannah Jennifer
2:20 PM	[25] Set2Graph: Secondary Vertex finding in Jets with Neural Networks	SHLOMI, Jonathan
2:40 PM	[32] Invertible Networks or Partons to Detector and Back Again	BUTTER, Anja
3:00 PM	[19] Hit-reco: ProtoDUNE denoising with DL models	ROSSI, Marco
3:20 PM	[37] Efficiency parametrization with Neural Networks	KAKATI, Nilotpall
3:40 PM	Coffee Break	
4:10 PM	[26] Zero-Permutation Jet Parton Assignment	YANG, Seungjin
4:30 PM	[12] Design by intelligent committee: use of machine learning as a scientific advisor	MENARY, Stephen Burns

# Thursday, October 22, 2020

## Workshop: Thursday morning (9:00 AM - 12:25 PM)

-Conveners: **Lorenzo Moneta**

time	[id] title	presenter
9:00 AM	[M11] AutoDQM: A Statistical Tool for Monitoring Data Quality in the CMS Detector	NGUYEN, Vivan Thi
9:20 AM	[M] Quantum Graph Neural Networks for Track Reconstruction in Particle Physics and Beyond	TUYSUZ, Cenk
9:40 AM	[M0] Quantum Generative Adversarial Networks	CHANG, Su Yeon
10:00 AM	Coffee Break	
10:20 AM	[M] SWAN: Powering CERN's Data Analytics and Machine Learning Use cases	CANALI, Luca CASTELLOTTI, Riccardo KOTHURI, Prasanth
10:40 AM	[M] Accelerating GAN training using distributed tensorflow and highly parallel hardware	DA COSTA CARDOSO, Renato Paulo
11:00 AM	[M] Using an Optical Processing Unit for tracking and calorimetry at the LHC	ROUSSEAU, David
11:20 AM	[M] MLaaS4HEP: Machine Learning as a Service for HEP	GIOMMI, Luca
11:25 AM	[M] Distributed training of graph neural network at HPC	JU, Xiangyang
11:30 AM	[M] Hyperparameter Optimisation for Machine Learning using ATLAS Grid and HPC	ZHANG, Rui
11:35 AM	[M] Identifying jets in the Lund plane	Dr DREYER, Frederic Alexandre
11:55 AM	[M] General recipe to form input space for deep learning analysis of HEP scattering processes.	DUDKO, Lev

## Workshop: Thursday afternoon (2:00 PM - 4:00 PM)

-Conveners: **Pietro Vischia; David Rousseau**

time	[id] title	presenter
2:00 PM	[M4] Lorentz Equivariant Neural Networks for Particle Physics	BOGATSKIY, Alexander
2:20 PM	[M9] Graph Neural Network-based Event Classification for Measurement of the Higgs-Top Yukawa Interaction	ROBERTS, Ryan
2:40 PM	[M0] Disentangling Boosted Higgs Boson Production Modes with Machine Learning	CHUNG, Yi-Lun
2:45 PM	[M8] Bayesian Neural Networks for Predictions from High Dimensional Theories	KRONHEIM, Braden

# Friday, October 23, 2020

## Workshop: Friday morning (10:00 AM - 12:20 PM)

-Conveners: **Andrea Wulzer**

time	[id] title	presenter
10:00	<del>A19</del> Foundations of a Fast, Data-Driven, Machine-Learned Simulator	HOWARD, Jessica N. HOWARD, Jessica Nicole
10:20	<del>A19</del> Selective background MC simulation with graph neural networks at Belle II	HARTMANN, Nikolai
10:25	<del>A19</del> Pixel Detector Background Generation using Generative Adversarial Networks at Belle II	Mr HASHEMI, Hosein
10:30	<del>A21</del> Reinforcement learning environment for deep learn physics dataset	Mr MAJEWSKI, Maciej MAJEWSKI, Maciej Witold
10:35	<del>A35</del> Improving particle-flow with deep learning	GANGULY, Sanmay
10:55	<del>A36</del> Super-resolution for calorimetry	DI BELLO, Francesco Armando
11:15	<del>A36</del> Deep learning solutions for 2D calorimetric cluster reconstruction at LHCb	MAZUREK, Michal
11:35	<del>A20</del> Object condensation: one-stage grid-free multi-object reconstruction in physics detectors, graph, and image data	KIESELER, Jan
11:55	<del>A37</del> UCluster: Unsupervised clustering for HEP	MIKUNI, Vinicius Massami
12:00	<del>P21</del> A readily-interpretable fully-convolutional autoencoder-like algorithm for unlabelled waveform analysis	KRIKLER, Benjamin

## Workshop: Friday afternoon (2:00 PM - 5:55 PM)

-Conveners: **Riccardo Torre**

time	[id] title	presenter
2:00 P	<del>M1</del> Teaching Machine Learning with ATLAS Open Data	EVANS, Meirin Oan
2:20 P	<del>M10</del> Active Anomaly Detection for time-domain discoveries	DE OLIVEIRA ISHIDA, Emille Eugenia
2:40 P	<del>M40</del> Generative Adversarial Network for Identifying the Dark Matter Distribution of a Dwarf Spheroidal Galaxy	LIM, Sung Hak
3:00 P	<del>M13</del> Pre-Learning a Geometry Using Machine Learning to Accelerate High Energy Physics Detector Simulations	KOURLITIS, Evangelos
3:05 P	<del>M23</del> High Fidelity Simulation of High Granularity Calorimeters with High Speed	EREN, Engin
3:10 P	<del>M42</del> Graph Convolutional Operators in the the PyTorch JIT	GRAY, Lindsey
3:15 P	<del>M9</del> GPU and FPGA as a Service for Machine Learning Inference Accelerations	LOU, Yu
3:20 PM	Coffee Break	
3:50 P	<del>M33</del> DisCo: Robust Networks and automated ABCD background estimation	SHIH, David
4:10 P	<del>M38</del> Decorrelation via Disentanglement	TAN, Justin
4:30 P	<del>M9</del> Enhancing searches for resonances with machine learning and moment decomposition	KITOUNI, Ouail
4:35 P	<del>M7</del> Simulation-Assisted Decorrelation for Resonant Anomaly Detection	BENKENDORFER, Kees Christian

4:55 PM	[12] Anomaly Awareness for BSM Searches at the LHC	KHOSA, Charanjit Kaur
5:15 PM	[19] Model-Independent Detection of New Physics Signals Using Interpretable Semi-Supervised Classifier Tests	CHAKRAVARTI, Purvasha
5:20 PM	[17] Conclusion and wrap-up	