Workshop on Machine Learning for Analysis of High-Energy Cosmic Particles

Tuesday 28 January 2025

Talks - Clayton Hall (11:00-12:30)

-Conveners: Aswathi Balagopal V

time	[id] title	presenter
11:00	[29] Deep Learning in Astroparticle Physics	GLOMBITZA, Jonas
11:45	[25] A Hybrid Approach to Event Reconstruction for Atmospheric Cherenkov Telescopes Combining Machine Learning and Likelihood Fitting (Remote)	Mr SCHWEFER, Georg
12:15	[24] Deep Learning applied to CTAO LST-1 and the difficulty to go from simulated to real data (Remote)	VUILLAUME, Thomas

Talks - Clayton Hall (14:00-15:30)

-Conveners: Matthias Plum

time	[id] title	presenter
14:00	[14] Machine Learning Techniques for Neutrino Reconstructions in IceCube	WEIGEL, Philip
14:45	[26] Interpretable Deep Learning for Event Reconstruction in IceCube	HUENNEFELD, Mirco

Talks - Clayton Hall (16:00-17:30)

-Conveners: Agnieszka Leszczynska

time	[id] title	presenter
16:00	[2] Towards improving efficiency of machine learning techniques in neutrino telescopes	YU, Felix
16:45	[8] Machine learning-based analyses using surface detector data of the Pierre Auger Observatory	HAHN, Steffen Traugott

Wednesday 29 January 2025

Talks - Clayton Hall (09:00-10:30)

-Conveners: Steffen Traugott Hahn

time	[id] title	presenter
09:00	[15] Machine Learning at Telescope Array (Remote)	KHARUK, Ivan
09:30	[28] Evaluation of energy reconstruction performance of the Telescope Array surface detector using a deep neural network and hybrid data (Remote)	PROSEKIN, Anton
10:00	[32] Reconstruction of energy and arrival directions of UHECRs registered by fluorescence telescopes with a neural network (Remote)	ZOTOV, Mikhail

Talks - Clayton Hall (11:00-12:30)

-Conveners: Felix Yu

time	[id] title	presenter
11:00	[11] Generative Neural Networks for Simulating Radio Emission from Air Showers (Remote)	SAMPATHKUMAR, Pranav
11:20	[30] Detection of Radio Signals from Cosmic Rays Using Convolutional Neural Networks with Data from SKALA antennas at IceTop	GÁLVEZ MOLINA, Paula
11:40	[4] Direction and energy reconstruction with uncertainty quantification for GRAND using graph neural network (Remote)	FERRIÈRE, Arsène BENOIT-LÉVY, Aurélien FOR THE GRAND COLLABORATION
12:00	[16] Denoising Radio Pulses from Air Showers Using Machine Learning Methods (Remote)	Mr LAI, Zhisen
12:15	[13] Convolutional Neural Network Processing of Radio Emission for Nuclear Composition Classification of Ultra-High-Energy Cosmic Rays (Remote)	Mrs MIHOREANU, Cosmina Dr ISAR, Paula Gina Mr CALAFETEANU, Tudor Alexandru

Talks - Clayton Hall (14:00-15:30)

-Conveners: Abdul Rehman

time	[id] title	presenter
14:00	[31] UHE Cosmic Ray Candidate Identification in RNO-G Deep Antennas Using Machine Learning	HENDRICKS, Bryan
14:20	[10] In-situ pulser depth reconstruction for RNO-G using Neural Network	AGARWAL, Sanyukta
14:40	[18] A Simulation-Based Inference Method for Electric Field Reconstruction (Remote)	Mr MCKINLEY, Thomas
14:55	[17] Reconstructing the Direction of Ultra-High-Energy Cosmic Rays Using a Simulation-Based Inference Method	Mr MASON, Zach
15:10	[34] The Radar Echo Telescope for Cosmic rays	GOPINATH, Krishna Nivedita

Talks - Clayton Hall (16:00-17:00)

-Conveners: Andrea Parenti

time	[id] title	presenter
16:00	[6] A graph neural network reconstruction for the IceAct telescopes	PAUL, Larissa
16:30	[7] Gamma/Hadron Separation using Machine Learning Methods with the IceAct Telescopes	MOLCHANY, Logan

Thursday 30 January 2025

Talks - Clayton Hall (09:00-10:30)

-Conveners: Jonas Glombitza

time	[id] title	presenter
09:00	[5] Mass composition study with machine learning on KASCADE archival data (Remote)	PETROV, Nikita
09:20	[20] Improving Gamma-ray Angular Resolution with Convolutional Neural Network De-noiser	Dr SHANG, Ruo-Yu
09:40	[19] Modeling IACT Gamma-ray Background using Singular Value Decomposition	Dr SHANG, Ruo-Yu
10:05	[23] Stereograph: stereoscopic event reconstruction using graph neural networks applied to CTAO (Remote)	Mrs ALI MESSAOUD, Hana

Talks - Clayton Hall (11:00-12:30)

-Conveners: Stef Verpoest

time	[id] title	presenter
11:00	[21] Fast Generation of Realistic Data-Driven Stereoscopic Shower Images using Generative Adversarial Networks (Remote)	Dr MANTHA, Kameswara Bharadwaj
11:30	[12] AI Agents for Ground-Based Gamma Astronomy (Remote)	KOSTUNIN, Dmitriy
12:00	[1] Application of graph networks to a next generation wide-field gamma-ray observatory in the southern sky	LEITL, Franziska

Talks - Clayton Hall (14:00-15:20)

-Conveners: Larissa Paul

time	[id] title	presenter
14:00	[22] Graph Neural Networks for Photon Search with the Underground Muon Detector of the Pierre Auger Observatory (Remote)	RODRIGUEZ, Ezequiel
14:20	[9] IceTop gamma-hadron separation and angular error estimation using machine learning techniques	VERGARA CARRASCO, Sebastian
14:40	[27] IceTop-CNN: Cosmic-Ray Reconstruction in IceTop using a Convolutional Neural Network with Low-Level Inputs (Remote)	DORR, Ethan
15:00	[3] Optimizing a Cosmic-ray Energy Estimator with Machine learning for the HAWC observatory (Remote)	CAPISTRÁN, Tomás

Talks - Clayton Hall (15:50-17:05)

-Conveners: Spencer Axani

time	[id] title	presenter
15:50	[37] Searching for Rare Astrophysical Events with Rare AI	Prof. LI, Aobo
16:35	[33] Machine learning using NuDot	SARFRAZ, Masooma