#### **ErUM-Data Community Information Exchange**



Contribution ID: 44

Type: not specified

# Speed improvements of MC Event Generators and Detector Simulations using Deep Neural Networks

Wednesday 1 January 2025 11:05 (5 minutes)

I am co-author of the DYTURBO event generator, predicting the differential cross-sections of vector boson production at the LHC. In order to improve the speed during the phase-space integration process, I would like to develop/include DNN-based phase-space sample algorithms.

Furthermore I am working on DNN based unfolding techniques and would be interested to extend the unfolding aspect to folding aspects, i.e. the full detector simulation.

#### List of Committees:

## Please describe your expertise/areas in which you would like to contribute / advise.

Improvements of Detector Simulations, Physic Object Reconstructions using Deep Neural Networks

#### Do you consent to the data usage and public abstract data posting in the ErUM-Data Community Information Exchange?

Yes

#### In ErUM-Data, what kind of data are you dealing with?

Data from ATLAS

#### What is your expertise in computing and / or software development?

Master in Computer Science with Focus on Artificial Intelligence, Guest-Professor at the Institute of Computer Science of the Uni. Marburg for "Simulations" from September 2021 onwards

#### What is your field and role?

Experimental Particle Physics (Uni Mainz) and Computer Science (Uni Marburg)

#### Your ErUM - Committee is

KET - Komitee für Elementarteilchenphysik

# Please describe areas in which you can contribute to "data handling" teaching.

Regular Classes of Artificial Intelligence as well as Statistics for Computer Science Students in Mainz / Marburg

#### My current most burning research question, I like to find partners for, is:

Speed improvement of MC Event Generators and Detector Simulations using Deep Neural Networks

## Please describe areas in which you would like to improve your knowledge / skills.

Phase-Space Sampling using DNNs

Primary author: SCHOTT, Matthias (Uni Mainz) Presenter: SCHOTT, Matthias (Uni Mainz)