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Fast Simulation with Generative Adversarial Networks

January 25, 2019 by Rich Brueckner   Leave a Comment   🖨

Fast Simulation with Generative Adversarial Networks

In this video from the Intel User Forum at SC18, Dr. Sofia Vallecorsa from CERN openlab presents: *Fast Simulation with Generative Adversarial Networks*.

> " *This talk presents an approach based on generative adversarial networks (GANs) to train them over multiple nodes using TensorFlow deep learning framework with Uber Engineering Horovod communication library.*

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Preliminary results on scaling of training time demonstrate how HPC centers could be used to globally optimize AI-based models to meet a growing community need."

An award-winning effort a has demonstrated potenti significantly change how t physics based modeling a simulation communities v machine learning. The CEF team demonstrated that A based models have the po to act as orders-of-magnit faster replacements for computationally expensive in simulation, while maintaining a remarkable level of accuracy.
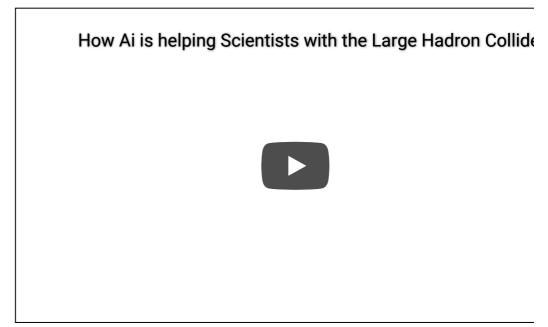
Dr. Sofia Vallecorsa points out that the CPU based runtime is important as nearly all of Geant user base runs on CPUs.

> As scientists consider future CERN experiments, Vallecorsa observes, *"Given future plans to upgrade CERN's Large Hadron Collider, dramatically increasing particle collision rates, frameworks like this have the potential to play an important role in ensuring data rates remain manageable."*

This kind of approach could help to realize similar orders-of-magnitude-faster speedu computationally expensive simulation tasks used in a range of fields. Vallecorsa explai the data distributions coming from the trained machine-learning model are remarkab to the real and simulated data.

[CERN openlab](#) is a unique public-private partnership that accelerates the developmen cutting-edge solutions for the worldwide LHC community and wider scientific research Through CERN openlab, CERN collaborates with leading ICT companies and research institutes.

How Ai is helping Scientists with the Large Hadron Collide

In this video from SC18 in Dallas, Dr. Sofia Vallecorsa from CERN OpenLab describes how A being used in design of experiments for the Large Hadron Collider.

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