PhysiX: A Foundation Model for Physics Simulations

PhysiX is an Autoregressive (next token) model with more than 4.5B parameters (as comparison, GPT-3 have abput 175B parameters and GPT-2 1.5B) trained on a massive scale to provide the probably first foundation model for physic-based applications. The goal is to use AI as surrogates for time expensive simulations.

PhysiX consists of 3 main components. An universal discrete tokenizer, to transform text and images into the same token space, an autoregressive transformer with 4.5B prameters, and an additional refinement module.

To ensure the ability to generalize pretrained versions from a video-generation model are used for the training of the tokenizer and the large scale transformer.

The process for the image-to-image translation is to first tokenize the satellite image, then inference through the large-scale transformer, then de-tokenize the output and inference through the refinement network.

Predicting the propagation of acoustic waves using deep convolutional neural networks

Deep Learning Surrogate for the Temporal Propagation and Scattering of Acoustic Waves