MOD TECH LABS

ACCELERATING AUTOENCODER TRAINING WITH ONEAPI: A SUCCESS STORY

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AGENDA

BUSINESS USE CASE

The transition from 60 frames a month to 60 frames second in film production is the latest digital transformation, called virtual production. Content is made on personal devices and played back on 20' x100ft+ screens. Enter, Autoencoder innovation to save the day.

INTRO TO AUTOENCODERS

An autoencoder is an unsupervised neural network compresses and encodes data then reconstructs data from the compressed data.

Uses:

Anomaly detection

Denoising

Image generation

Feature extraction

Acceleration in their training is essential because its very slow especially with large datasets like in film.

BUSINESS CASE

ACCELERATION WITH oneAPI

oneAPI key differentiators:

- **Speed**
- **Accuracy**
- **Easy of Implementation**

We got a 32x acceleration from using oneAPI and increased our precision by double.
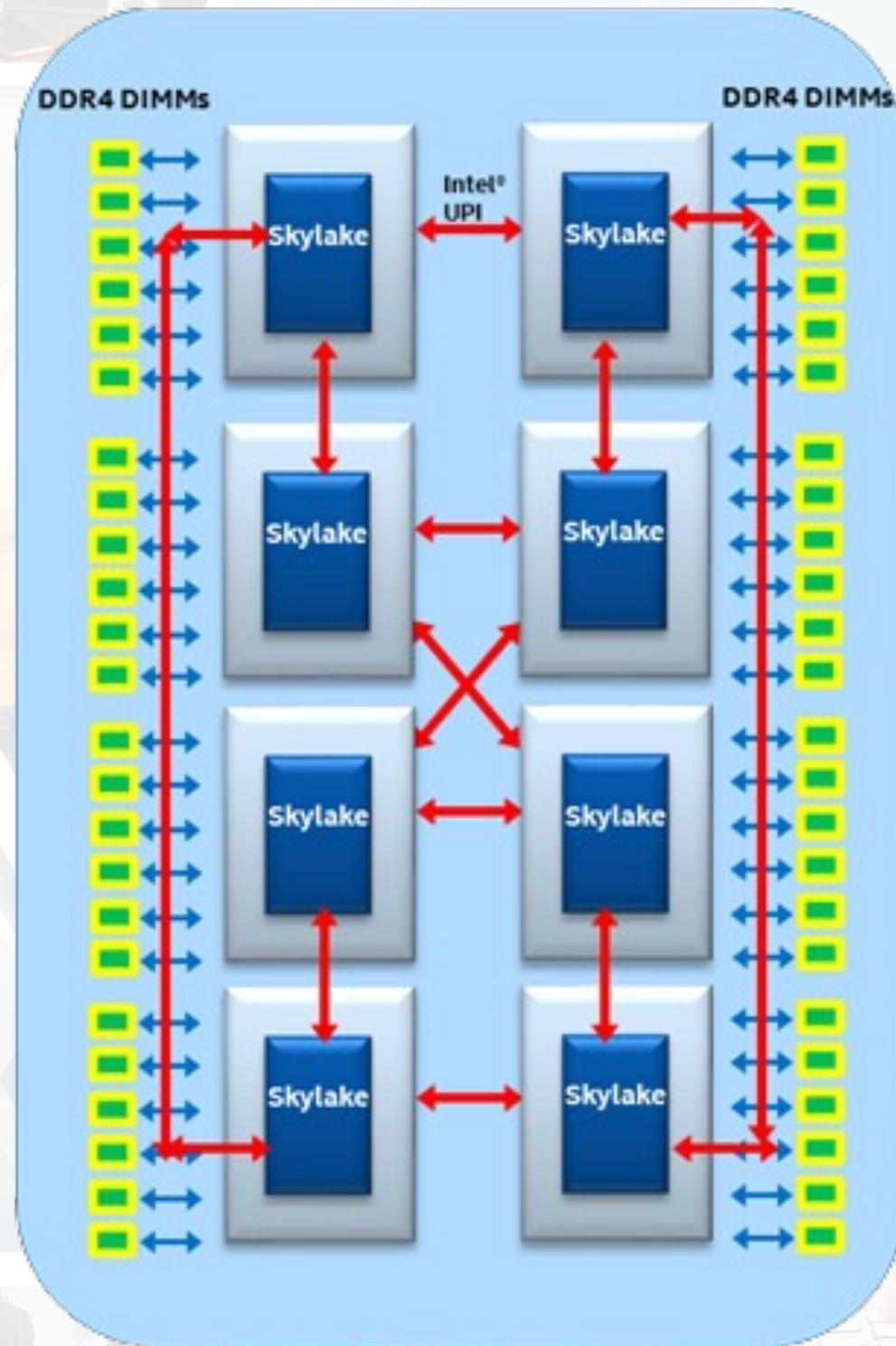
TECH CASE

ENHANCEMENT WITH oneAPI

Intel oneAPI PyTorch
Intel Extension for PyTorch

- Performance enhancement
- Performance customizations with API
- Reduce computational load

EXPLORING INTEL ARCHITECTURE

Intel is the only architecture that can be used to solve this problem based on the 4-way and 8-way CPU systems which allow for the acceleration.

The Old Way:
256 cores on 2 cpus without a single epoch out of 5000 - the sun would die before we got a model.

SUCCESS STORY

I. The first trial dataset is a 5000 image dataset with 64 images per batch resulting in a trained model within 24 hours.

II. Then the weights will be adjusted for maximum quality.

III. The next phase is a full-scale test of over 50k images that will be processing over a 10-30 day period to deliver the final algorithm.

KEY TAKEAWAYS

01

Easy and fast implementation using oneAPI

02

Changes needed were very minimal for the best results

03

Hardware implementation was very simple including CPU vs GPU and even server changes within 15 minutes

CALL TO ACTION

Try out Intel's oneAPI for autoencoder training needs

Checkout modtechlabs.com for white papers on more machine learning for production

THANK YOU

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