

MOD TECH LABS 

ACCELERATING AUTOENCODER TRAINING WITH ONEAPI: A SUCCESS STORY

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AGENDA

- **Business Use Case**
- **Intro to Autoencoders**
- **Acceleration with oneAPI**
- **Enhancement with oneAPI**
- **Exploring Intel's Architecture**
- **Our Success Story**
- **Key Takeaways**
- **Call to Action**



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.

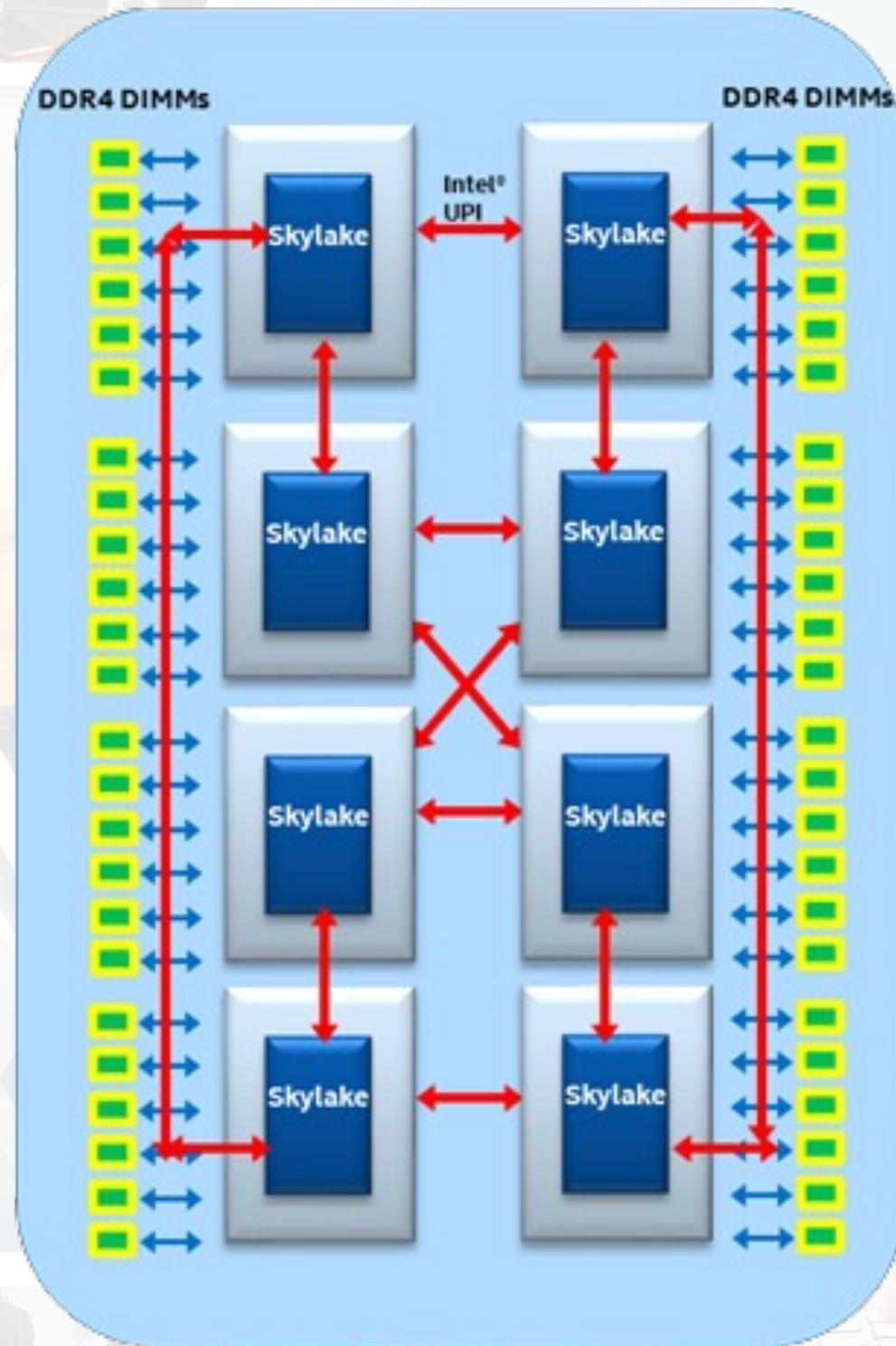
TECH CASE

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

The Intel logo, featuring the word "intel" in a blue, lowercase, sans-serif font with a small registered trademark symbol (®) to its right. The background of the slide is a light blue hexagonal pattern with various images of people working in a tech environment, including one person pointing at a screen, another at a laptop, and a group of people in a meeting.The MOD TECH LABS logo, featuring the word "MOD" in a large, blue, sans-serif font with a dotted pattern inside the letter "O", followed by "TECH LABS" in a smaller, blue, sans-serif font stacked vertically to its right.

**THANK
YOU**

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