Deep Learning for Intelligent Video Analytics

Learn via: **Classroom / Virtual Classroom / Online**

Duration: **1 Gün**

Overview

This hands-on workshop teaches you the foundational elements of intelligent video analytics (IVA) by integrating deep learning models and algorithms into a ready-to-use NVIDIA DeepStream pipeline. First, you'll gain an in-depth understanding of data normalization, annotation, and metadata formatting in IVA applications, followed by a fundamental understanding of object detection in video frames. You'll proceed to train object tracking models and learn how to utilize temporal features of videos to achieve more efficient detection models. You'll also learn to deploy and accelerate the development of your IVA application by plugging deep neural networks into an end-to-end stream processing pipeline using the DeepStream framework. Throughout the workshop, you'll get hands-on coding experience using a live GPU-accelerated environment to deploy and train your models. At the end, you'll have access to additional resources to design and deploy IVA applications on your own.

Prerequisites

Experience with deep neural networks (specifically variations of CNNs) and intermediate-level experience with C and Python

What You Will Learn

Learning Objectives

- Wrangle video data and perform raw data ingestion into underlying models
- Deploy deep learning models for accurate and effective object detection and tracking applications
- Accelerate the development of IVA applications by using the DeepStream framework

Why Deep Learning Institute Hands-on Training?

- Learn how to build deep learning and accelerated computing applications across a wide range of industry segments such as autonomous vehicles, digital content creation, finance, game development, healthcare, and more
- Benefit from guided hands-on experience using the widely-used, industry-standard software, tools, and frameworks
- Gain real world expertise through content designed in collaboration with industry leaders such as the Children's Hospital Los Angeles, Mayo Clinic, and PwC
- Earn a DLI certificate to demonstrate your subject matter competency and support professional career growth
- Access content anywhere, anytime with a fully-configured, GPU-accelerated workstation in the cloud

Certification:

DLI certificate of subject matter competency is granted upon successful completion of assessment at the end of the workshop.

Outline

Object Detection for Intelligent Video Analytics (IVA)

- Prepare metadata for object detection models and learn the fundamentals of Object Detection API
- Apply frame-by-frame detection models and compare their KPI results and utilize advanced techniques of qualitative analysis and performance measurement

Learn the fundamentals of object detection methods in IVA applications, as well as preliminaries of raw data processing and metadata formatting. Get hands-on experience with the Object Detection API and learn how to measure accuracy and
performance of the models using IoU metrics.

Using Transfer Learning and Multiple Object Tracking Techniques in IVA

- Generate TFRecords to optimize the training performance and use transfer learning techniques to fine tune the model
- Measure and visualize model performance

Get familiar with the nuances of fine tuning an IVA application and learn about the implications of modeling. Understand how object detectors can be

bootstrapped into your IVA application.

Deploying the Application Using NVIDIA DeepStream

- Create and deploy easily configurable, end-to-end video processing pipelines
- Learn how to easily plugin multiple inference models, and explore methods for visualizing the inference data.

Learn to deploy the video analytics models into a ready-to-use video processing pipeline using DeepStream and understand the fundamentals of creating robust smart city applications. Learn about various plugins to embed into your pipeline, as well as NVIDIA's dedicated video codec plugins.

Next Steps and Q&A

- Discuss the next-steps and questions.

Use this time to discuss any questions about assessment/material.