AI Powered Computer Vision

- 3-Day Class
- Hands-on labs

Course Overview

You will develop the skills to obtain and organize data for fine-tuning pre-trained Vision Transformers (ViT). Combining lectures and hands-on labs, the course covers ViT transformer-based architectures, Python programming for AI models, and deploying open-source Transformer models. You will gather, clean, label, and organize data, gaining practical experience with ViT frameworks through hands-on exercises. Advanced topics like context extension, fine-tuning, and quantization for Road Surface Image Classification are explored. The course concludes with the opportunity to earn an AI certification from Alta3 Research, ideal for Python Developers, DevSecOps Engineers, and Managers or Directors seeking practical AI applications in the enterprise.

Review this course online at https://www.alta3.com/courses/ai-vision

Who Should Attend

- Project Managers
- Architects
- Developers
- Data Acquisition Specialists

What You'll Learn

- Clean and Curate Data for ViT
- Prepare Dataset for ViT
- Fine-Tune ViT Models with PyTorch
- Install and use ViT frameworks
- Understand Visual Transformer Model architecture
- Establish guidelines for obtaining RAW Data
- Perform End-to-End Fine-Tuning of ViT
- Deploy and Maximize ViT Model Performance
- Describe patches and embeddings in ViT

Outline

The Visual Transformer Model

- 💬 Lecture: What is Intelligence?
- 💬 Lecture: Generative AI
- 💬 Lecture: The Transformer Model
- 💬 Lecture: Feed Forward Neural Networks

Computer Vision

- 💬 Lecture: Introduction to Computer Vision

- 💬 Lecture: NLP to ViT: Key Modifications
- 💻 Lecture + Lab: Patch Embedding
- 💻 Lecture + Lab: Positional Encoding in Vison Transformer
- 💬 Lecture: CNN vs ViT - A Comparison

Pre-trained ViT

- 💬 Lecture: Preparing A100 for Server Operations
- 💬 Lecture: Selecting a Pre-Trained ViT Model
- 💻 Lecture + Lab: Operating Google ViT Model for Face Recognition
- 💻 Lecture + Lab: Operating Microsoft BEiT Model for Scene Segmentation

Data Curation for Road Surface ViT

- 💬 Lecture: Curating Data for ViT
- 💻 Lecture + Lab: Gathering Raw Data
- 💻 Lecture + Lab: Data Cleaning and Preparation
- 💻 Lecture + Lab: Data Labeling
- 💻 Lecture + Lab: Data Organization
- 💬 Lecture: Premade Datasets for Fine Tuning
- 💻 Lecture + Lab: Obtain and Prepare Premade Datasets

Fine Tuning for Road Surface Image Classification

- 💬 Lecture: Fine-Tuning a Pre-Trained ViT
- 💬 Lecture: PyTorch
- 💻 Lecture + Lab: Fine Tuning ViT with PyTorch
- 💻 Lecture + Lab: Operating our Road Surface Image Classification ViT Model

Prerequisites

- Python - PCEP Certification or Equivalent Experience
- Familiarity with Linux
- Familiarity with Natural Language Processing