# Computer Vision for Research in Image and Video Analytics Training Course

Professional Development Training Course Outline

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|---|---|---|---|
| **Category** | Research and Data Analysis | **Duration** | 5 Days |
| **Base Fee** | $1,500 USD | **Delivery Mode** | Online / On-site Hybrid |

## Course Introduction

In the era of artificial intelligence and big data, *computer vision* has emerged as a groundbreaking technology transforming industries and driving innovation in scientific research. Computer Vision for Research in Image and Video Analytics Training Course is designed for researchers, data scientists, and professionals aiming to harness the power of image and video analysis for real-world applications. Through advanced computer vision techniques, participants will learn how to extract meaningful insights from visual data, automate analysis, and develop models that interpret human-level perception.

With a strong focus on deep learning, image classification, video surveillance, and object detection, this training offers hands-on experience using OpenCV, TensorFlow, YOLO, and Python-based frameworks. By engaging in real-world case studies and projects, learners will understand how computer vision contributes to fields such as medical imaging, autonomous vehicles, agriculture, and behavioral research. Join us to elevate your research and innovation using advanced image and video analytics.

## Programme Curriculum

**Computer Vision for Research in Image and Video Analytics Training Course**

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**Course Objectives**

1. Understand the fundamentals of computer vision and its role in AI-powered research.
2. Learn key techniques in image processing and video analytics.
3. Apply deep learning models like CNNs for object recognition and classification.
4. Explore real-time object detection using YOLO and SSD algorithms.
5. Utilize OpenCV and Python for developing computer vision solutions.
6. Analyze medical images using segmentation and classification techniques.
7. Perform face detection and recognition in security and research contexts.
8. Implement gesture and motion tracking from video datasets.
9. Design autonomous systems using video feeds and machine vision.
10. Evaluate performance using metrics like precision, recall, and F1-score.
11. Integrate computer vision in behavioral science and ethnographic research.
12. Conduct video annotation and create datasets for training neural networks.
13. Publish research using computer vision-based methodologies.

**Target Audience**

1. Academic Researchers in AI and Vision Science
2. Data Scientists and Machine Learning Engineers
3. Healthcare Imaging Analysts
4. Security and Surveillance Professionals
5. Behavioral and Social Science Researchers
6. Robotics and Autonomous System Developers
7. Graduate and Postgraduate Students in AI
8. Digital Forensics Experts

**Course Duration:** 5 days

**Course Modules**

**Module 1: Introduction to Computer Vision and Image Analytics**

- Overview of computer vision in research
- Types of visual data and image formats
- Understanding pixels, resolution, and transformations
- Role of AI in vision systems
- Key computer vision libraries (OpenCV, Scikit-Image)
- **Case Study:** Evolution of computer vision in cancer diagnostics

**Module 2: Fundamentals of Image Processing**

- Image enhancement and filtering techniques
- Histogram equalization and thresholding
- Morphological operations (erosion, dilation)
- Edge detection and feature extraction
- Contour analysis
- **Case Study:** Improving satellite image clarity for climate research

**Module 3: Deep Learning for Image Recognition**

- CNN architecture and applications
- Data preparation and augmentation
- Transfer learning using pre-trained models
- Multi-class image classification
- Accuracy and confusion matrix evaluation
- **Case Study:** Classifying plant diseases using CNN

**Module 4: Object Detection and Localization**

- Introduction to YOLO, SSD, and Faster R-CNN
- Bounding box regression
- Intersection over Union (IoU)
- Object tracking over frames
- Labeling datasets for training
- **Case Study:** Real-time pedestrian detection in urban planning

**Module 5: Video Analytics and Scene Understanding**

- Video segmentation and frame differencing
- Motion detection and temporal analysis
- Action recognition in surveillance footage
- Crowd behavior analysis
- Real-time video processing with OpenCV
- **Case Study:** Monitoring public gatherings for safety analytics

**Module 6: Specialized Applications in Medical Imaging**

- Image segmentation for MRI and CT scans
- Pattern recognition in X-ray and ultrasound
- Anomaly detection using AI
- Integration of vision with medical records
- Tools for labeling and annotating medical images
- **Case Study:** AI-based detection of diabetic retinopathy

**Module 7: Computer Vision in Social Science Research**

- Facial emotion recognition in ethnographic studies
- Gesture analysis in behavioral experiments
- Automated coding of interview videos
- Visual ethics and participant consent
- Software for qualitative video analysis
- **Case Study:** Vision-based mood tracking in therapy sessions

**Module 8: Capstone Project and Model Deployment**

- Project planning and dataset creation
- Model training, testing, and optimization
- Exporting models for deployment (ONNX, TensorFlow Lite)
- Deployment in cloud and edge devices
- Report writing and visualization
- **Case Study:** Real-time wildlife monitoring using drones and CV models

**Training Methodology**

- Instructor-led theoretical and practical sessions

- Hands-on coding exercises with datasets
- Guided tutorials using Python and TensorFlow
- Group collaboration through project-based learning
- Case study analysis and presentations
- Post-course assignments and research proposal development

**Register as a group from 3 participants for a Discount**

**Send us an email: info@fineskilltrainingcenter.org or call** *+254769199797*

***Certification***

*Upon successful completion of this training, participants will be issued with a globally- recognized certificate.*

***Tailor-Made Course***

*We also offer tailor-made courses based on your needs.*

**Key Notes**

**a.** The participant must be conversant with English.

**b.** Upon completion of training the participant will be issued with an Authorized Training Certificate

**c.** Course duration is flexible and the contents can be modified to fit any number of days.

**d.** The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

**e.** One-year post-training support Consultation and Coaching provided after the course.

**f.** Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

## Upcoming Scheduled Sessions

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Online | $1,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $1,500 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $3,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $4,500 |

| Start Date | End Date | Location | Price |
|---|---|---|---|
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |
| **23 Nov 2026** | 27 Nov 2026 | Physical | $6,000 |

Ready to enroll or request a customized program? Book online or contact us:

**Register Online Now**

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com