



مركز الوقت للتدريب
Time Training Center

COMPUTER VISION FOR INDUSTRIAL INSPECTION COURSE



Introduction

The Computer Vision for Industrial Inspection Course equips professionals with the skills to implement and manage machine vision systems for automated quality control and defect detection in industrial environments. This course covers image processing, pattern recognition, camera calibration, and real-time system integration—tailored specifically for use cases in manufacturing, automotive, electronics, and logistics. Ideal for engineers, automation specialists, and AI practitioners, it bridges the gap between theoretical computer vision and its practical industrial deployment.

Learning Objectives

- Understand core concepts of machine vision and imaging
- Design computer vision systems for defect detection
- Integrate cameras and vision algorithms into inspection lines
- Apply image pre-processing, segmentation, and feature extraction
- Optimize industrial inspection accuracy and reliability

Course Details

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|------------------|---------------------|
| Mode of Training | Classroom or Online |
| Duration | 5 Days |

Who Should Attend

- Industrial automation engineers and quality control managers
- AI and computer vision developers
- Manufacturing and production specialists
- Professionals involved in smart factory solutions

Certificate(s)

Participants who complete a minimum of 80% of the total training hours will receive a **Certificate of Completion** issued by **Time Training Center**. This certificate reflects their active participation and commitment to professional development in the relevant field.



Course Outline

Module 1: Fundamentals of Computer Vision in Industry

- Introduction to computer vision principles
- Benefits and limitations of vision systems in industrial applications
- Common use cases: quality assurance, defect detection, process automation

Module 2: Image Acquisition and Camera Systems

- Basics of industrial imaging hardware: cameras, lenses, sensors
- Lighting techniques and optical configurations
- Camera calibration, alignment, and system setup considerations

Module 3: Image Pre-processing Techniques

- Noise reduction, filtering, and image enhancement methods
- Image normalization, thresholding, and contrast adjustment
- Preparing images for robust feature extraction and analysis

Module 4: Object Detection and Feature Extraction

- Techniques for edge detection, contour finding, and blob analysis
- Pattern matching, template matching, and keypoint detection
- Feature engineering and shape-based analysis for industrial objects

Module 5: Defect Detection and Classification

- Supervised learning methods (e.g., classification algorithms)
- Unsupervised learning approaches for anomaly detection
- Applying AI and machine learning models to visual inspection tasks
- Metrics for evaluating detection performance (precision, recall, accuracy)

Module 6: System Integration and Real-Time Deployment

- Vision system architecture: software and hardware interfacing
- Challenges in real-time inspection and optimization strategies
- Industrial case studies: applications in assembly lines, packaging, and electronics manufacturing



Methodology

We employ a comprehensive and applied learning strategy, integrating theory with real-world implementation:

- ❖ **Conceptual Learning:** Expert-led sessions on catalytic theory and engineering principles
- ❖ **Interactive Workshops:** Group exercises, presentations, and technical discussion forums
- ❖ **Case-Based Learning:** Industry-specific examples and troubleshooting scenarios
- ❖ **Technology Integration:** Digital tools, simulations, and catalyst modeling applications
- ❖ **Assessment:** Pre-tests, post-tests, and Competence Validation Exams for Certified courses to ensure knowledge transfer and skills validation

Note: Instructors may adjust the training approach to fit technical requirements or participant engagement levels.

Instructors

Our instructors are seasoned computer vision engineers and industrial automation specialists with extensive experience in deploying machine vision systems across manufacturing environments. They offer a practical, tool-driven approach, helping learners translate theory into scalable industrial solutions. Detailed trainer profiles will be shared post scheduling.

About Time Training Center

Time Training Center is a leading professional training institute in Abu Dhabi that provides students and professionals with quality education and skill development programs. Time Training Center is accredited by the Abu Dhabi Center for Technical Vocational Education & Training (ACTVET) with a specialization in Computer and Management Training programs and certified by QA QC with ISO 9001:2015.

Operating in Abu Dhabi for over 3 decades, Time Training Center has established brand value as a high-quality Management & Technical Training Center in Abu Dhabi. We have also secured strong loyalty from corporate companies and associations with our holistic and practical teaching approach.

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