COURSE OVERVIEW IT0035
Face Detection with OpenCV in Python

Course Title
Face Detection with OpenCV in Python

Course Date/Venue
Session 1: May 25-29, 2025/Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
Session 2: September 22-26, 2025/Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
IT0035

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Face Detection with OpenCV in Python. It covers the face detection and the difference between detection and recognition; setting-up OpenCV in Python and image processing fundamentals in OpenCV; the OpenCV basics for face detection and video capture and processing in OpenCV; the Haar cascade, working with XML Haar cascade files and how OpenCV uses Haar features for face detection, strengths and limitations of Haar cascade; and accessing OpenCV's built-in Haar cascade XML files, detecting faces in a static image, drawing bounding boxes around detected faces and tuning detection parameters for better accuracy.

Further, the course will also discuss the real-time face detection using Haar cascades, detecting facial features using Haar cascade and performance optimization in Haar-based face detection; the limitations of Haar cascades in face detection and deep learning for face detection; installing and loading OpenCV's DNN face detector and real-time face detection with deep learning models; the facial landmarks and feature detection and comparing different face detection techniques; and the face tracking with OpenCV and AI-based face detection using deep learning models.

During this interactive course, participants will learn the face detection in low-resolution and noisy images, face detection with mask and occlusions and AI-based real-time face detection optimization; using face detection for real-time security monitoring and AI-based intruder detection with face recognition; the facial feature extraction for biometric security and face detection models in smart CCTV systems; the face detection in attendance and access control systems and cloud and mobile applications; and the ethical and privacy concerns in face detection.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain a fundamental knowledge on face detection with OpenCV in Python
- Discuss face detection and the difference between detection and recognition
- Set-up OpenCV in Python and image processing fundamentals in OpenCV
- Apply OpenCV basics for face detection and video capture and processing in OpenCV
- Define Haar Cascade, work with XML Haar Cascade files and identify how OpenCV uses Haar features for face detection including its strengths and limitations
- Access OpenCV's built-in Haar cascade XML files, detect faces in a static image, draw bounding boxes around detected faces and tune detection parameters for better accuracy
- Apply real-time face detection using Haar Cascades, detecting facial features using Haar cascade and performance optimization in Haar-based face detection
- Recognize the limitations of Haar Cascades in face detection and use deep learning for face detection
- Install and load OpenCV's DNN face detector and apply real-time face detection with deep learning models
- Apply facial landmarks and feature detection and compare different face detection techniques
- Implement face tracking with OpenCV and AI-based face detection using deep learning models
- Carryout face detection in low-resolution and noisy images, face detection with mask and occlusions and AI-based real-time face detection optimization
- Use face detection for real-time security monitoring and AI-based intruder detection with face recognition
- Apply facial feature extraction for biometric security and deploy face detection models in smart CCTV systems
- Employ face detection in attendance and access control systems, deploying face detection in cloud and mobile applications and ethical and privacy concerns in face detection

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of face detection with OpenCV in Python for beginners in computer vision, python enthusiasts, AI and machine learning enthusiasts, software developers, engineers and other technical staff.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Abdel Aziz Issa, MSc, BSc, is a Senior **Instrumentation & Communications Engineer** with extensive years of experience in the **Water & Electricity** and **Utilities**. He specializes in **Python, Python for Cybersecurity**, **Python with TensorFlow for Deep Learning**, **Python for Data Science and Machine Learning**, **CompTIA**, **Network+**, **Network** Configuration & Management, **Network** Monitoring, **Network** Design & Implementation, **Systems & Networks Protection**, **Network** Fundamentals & Troubleshooting, Advanced **Networking** Technology, **Operating System** Installation & Upgrading, **IP** Installation & Networking, **Ethical Hacking** (CEH V.10), **Access Control** Management, Software, Hardware, Modeling, Simulation & Design, **WiMax Broadband Wireless**, **SDH Networks**, **IPT Avaya Network**, **WAN & Satellite** Communication, **Wireless** Technology RC-400, **Detection System** Using Machine Learning, Certified **Computer Forensics**, Certified **Secure Computer User** (**CSCU**), Computer-Based Office Administration & Organization, ICDL, MS Office & Excel, **Security** Protocols & Best Practices, **Security** Awareness & Training, **Security Audits**, **Security Policies & Procedures** Development, **Risk** Management, **Resource** Management, **Leadership** & Management, **Vendor** Management, **Operations** Management, **Finance** Management, **Communication** Skills, **Strategic Thinking**, Continuous Learning & Development and **Team Building**.

During his career life, Mr. Abdel has gained his practical and field experience through his various significant positions and dedication as the **Network & System Administrator**, **Information Security Specialist**, **Network Engineer**, **Computer Networks & Cybersecurity Technical Practitioner**, **Sales & Computer Technician**, **Lecturer**, **Practitioner** and **Instructor/Trainer** for Saudi Arabia Culture Mission, Applied Science University and Microtech for Computers, just to name a few.

Mr. Abdel has a **Master's** degree in **Computer Science**, a **Bachelor's** degree in **Information Technology & Computing** and a **Diploma** in **Computer Technology**. Further, he is a **Certified Ethical Hacker**, a **Microsoft System Center IT Professional** (**MCITP**), a **Microsoft System Center Configuration Manager** (**SCCM**) and has numerous academic certifications on **Hardware & Software** Maintenance, **CCNA** (Cisco Certified Network Associate), **Cisco Wireless LANs**, **Oracle** 10g, **Mac** Certificate from Modern Systems Co. (OSX, Technical and Server), **FortiAnalyzer**, **FortiGate UTM**, **Data Center Design Professional** (**DCDP**) and has further delivered numerous trainings, courses, workshops, seminars and conferences globally.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Face Detection & Computer Vision*** *What Is Face Detection? Difference Between Detection & Recognition • Applications of Face Detection in Real-World Scenarios • Traditional versus AI-Based Face Detection Techniques • Overview of OpenCV & Its Role in Computer Vision*
0930 – 0945	*Break*
0945 – 1030	***Setting Up OpenCV in Python*** *Installing OpenCV & Required Dependencies • Understanding OpenCV's Basic Functions for Image Processing • Loading & Displaying Images with OpenCV • Converting Images to Grayscale for Face Detection*
1030 – 1130	***Image Processing Fundamentals in OpenCV*** *Reading & Writing Images Using OpenCV • Resizing, Cropping & Rotating Images • Applying Filters & Edge Detection • Understanding Image Thresholding*
1130 – 1230	***OpenCV Basics for Face Detection*** *Understanding OpenCV's Cascade Classifier • How Haar Cascades Work for Face Detection • Loading Pre-Trained Haar Cascade Models • Detecting Objects Using Haar Cascade Classifier*
1230 – 1245	*Break*

1245 – 1330	***Video Capture & Processing in OpenCV*** *Accessing a Webcam Using OpenCV • Capturing & Displaying Frames from a Video Stream • Saving Processed Videos with OpenCV • Real-Time Image Manipulation on Video Streams*
1330 – 1420	***Hands-On: Basic Image & Video Processing with OpenCV*** *Writing a Python Script to Capture Video • Converting Video Frames to Grayscale • Applying Edge Detection to Video Streams • Saving Processed Frames as Images*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Understanding Haar Cascade Classifier*** *What Is a Haar Cascade? • Working with XML Haar Cascade Files • How OpenCV Uses Haar Features for Face Detection • Strengths & Limitations of Haar Cascade*
0830 – 0930	***Loading Pre-Trained Haar Cascades for Face Detection*** *Accessing OpenCV's Built-In Haar Cascade XML Files • Detecting Faces in a Static Image • Drawing Bounding Boxes Around Detected Faces • Tuning Detection Parameters for Better Accuracy*
0930 – 0945	*Break*
0945 – 1100	***Real-Time Face Detection Using Haar Cascades*** *Using Haar Cascade for Real-Time Face Detection in Video • Enhancing Detection with Different Image Preprocessing Techniques • Multi-Scale Detection & Performance Optimization • Handling False Positives & False Negatives*
1100 – 1230	***Detecting Facial Features Using Haar Cascades*** *Detecting Eyes, Nose, & Mouth • Overlaying Filters on Facial Features • Improving Detection Speed & Accuracy • Case Study: Face Tracking with Haar Cascades*
1230 – 1245	*Break*
1245 – 1330	***Performance Optimization in Haar-Based Face Detection*** *Understanding Processing Time & Frame Rate • Multi-Threading for Efficient Face Detection • Reducing False Positives Using Image Processing Techniques • Comparing Haar Cascade versus Deep Learning-Based Face Detection*
1330 – 1420	***Hands-On: Implementing Haar Cascade for Face Detection*** *Writing a Python Script to Detect Faces in Images • Real-Time Face Detection in Webcam Streams • Applying Haar Cascades to Video Files • Experimenting with Different Pre-Trained Haar Cascade Models*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Deep Learning-Based Face Detection*** *Limitations of Haar Cascades in Face Detection • Why Use Deep Learning for Face Detection? • Overview of OpenCV's DNN Module • Understanding SSD (Single Shot Multibox Detector)*
0830 – 0930	***Installing & Loading OpenCV's DNN Face Detector*** *Downloading Pre-Trained DNN Face Detection Models • Loading Models in OpenCV Using DNN Module • Comparing Caffe & Tensorflow Face Detection Models • Detecting Faces in Images with DNN Model*
0930 – 0945	*Break*
0945 – 1100	***Real-Time Face Detection with Deep Learning Models*** *Using OpenCV's DNN Module for Face Detection in Video • Optimizing Detection Speed with CUDA (GPU Acceleration) • Handling Multiple Faces in a Single Frame • Benchmarking DNN versus Haar Cascade Performance*
1100 – 1230	***Facial Landmarks & Feature Detection*** *Introduction to Facial Landmark Detection • Using Dlib's Pre-Trained Models for Landmark Detection • Aligning & Normalizing Faces for Better Detection • Applications of Facial Landmark Detection*
1230 – 1245	*Break*
1245 – 1330	***Comparing Different Face Detection Techniques*** *Haar Cascade versus DNN Face Detector • YOLO & Faster R-CNN for Face Detection • Accuracy, Speed, & Computational Performance Trade-Offs • When to Use Which Face Detection Method?*
1330 – 1420	***Hands-On: Implementing DNN-Based Face Detection*** *Running a Pre-Trained DNN Face Detector on Images • Real-Time Face Detection with OpenCV's DNN Module • Comparing Detection Accuracy Between Haar & DNN • Experimenting with Different Confidence Thresholds*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the T were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Implementing Face Tracking with OpenCV*** *Face Detection versus Face Tracking • Introduction to OpenCV's Multi-Object Tracking • Using MOSSE & KCF Trackers for Face Tracking • Real-Time Face Tracking in Video Streams*
0830 – 0930	***AI-Based Face Detection Using Deep Learning Models*** *Using Pre-Trained Deep Learning Models for Face Detection • Exploring OpenCV with MobileNet SSD for Face Detection • Using FaceNet for Face Verification • Face Detection in Low-Light & Occlusion Scenarios*
0930 – 0945	*Break*
0945 – 1100	***Face Detection in Low-Resolution & Noisy Images*** *Challenges in Face Detection with Low-Quality Images • Enhancing Image Quality Using AI-Based Super-Resolution • Noise Reduction Techniques for Better Detection Accuracy • Case Study: Improving Face Detection in Surveillance Footage*
1100 – 1230	***Face Detection with Mask & Occlusions*** *Handling Face Detection with Partial Occlusion • Detecting Faces with Sunglasses, Masks, & Hats • Improving Face Detection with Augmented Training Data • AI-Powered Occlusion Handling Techniques*

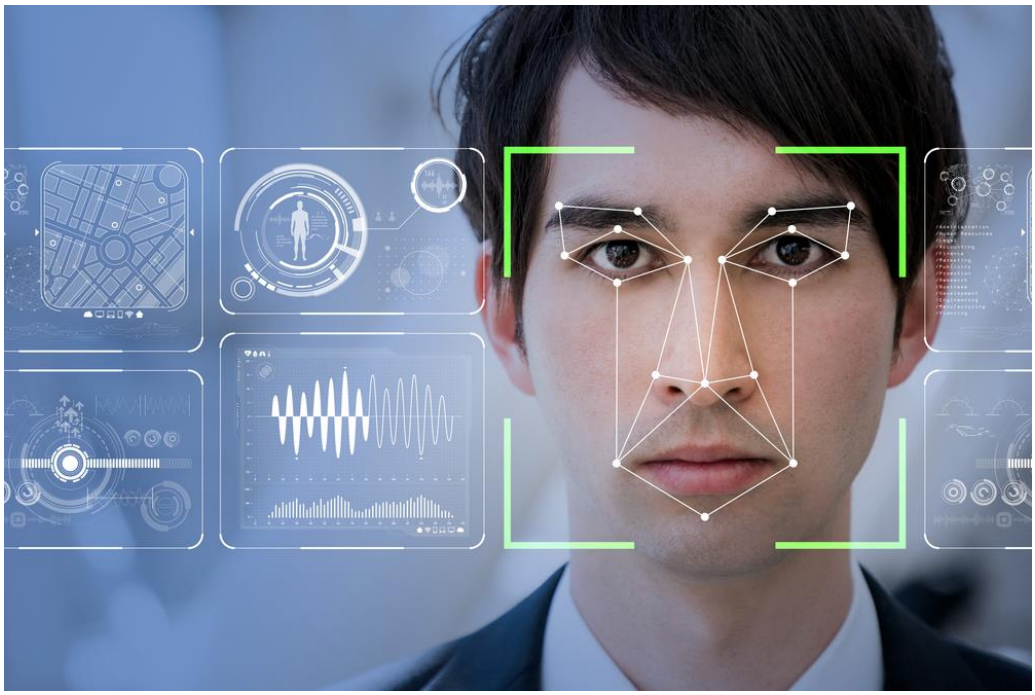
1230 – 1245	*Break*
1245 – 1330	***AI-Based Real-Time Face Detection Optimization*** *Reducing Computational Overhead in Face Detection • Optimizing Detection Speed with Hardware Acceleration (CUDA, TensorRT) • Deploying Face Detection Models on Edge Devices (Raspberry Pi, Jetson Nano) • Case Study: Face Detection for IoT-Based Smart Security Systems*
1330 – 1420	***Hands-On: Implementing Face Tracking & Advanced Face Detection*** *Face Tracking with OpenCV & Dlib • Implementing AI-Based Face Detection on Edge Devices • Running AI Face Detection Models on a Mobile Phone • Experimenting with OpenCV's Face Detection in Low-Light Conditions*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the T were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***Face Detection for Security & Surveillance Systems*** *Using Face Detection for Real-Time Security Monitoring • AI-Based Intruder Detection with Face Recognition • Facial Feature Extraction for Biometric Security • Deploying Face Detection Models in Smart CCTV Systems*
0830 – 0930	***Face Detection in Attendance & Access Control Systems*** *AI-Based Employee Attendance Systems • Face Detection for Contactless Entry Systems • Integrating Face Detection with RFID & IoT • Case Study: AI in Automated Attendance Management*
0930 – 0945	*Break*
0945 – 1100	***Deploying Face Detection in Cloud & Mobile Applications*** *Deploying Face Detection Models Using Flask API • Integrating Face Detection with Android & Ios Apps • Cloud-Based Face Detection with Google Vision API • Using AWS & Azure for Face Detection Applications*
1100 – 1230	***Ethical & Privacy Concerns in Face Detection*** *Ethical Issues in AI-Based Face Detection • Privacy Laws & Regulations (GDPR, CCPA) • Preventing AI Bias in Face Detection Systems • Best Practices for Responsible AI Development*
1230 – 1245	*Break*
1245 – 1345	***Final Hands-On Project & Deployment*** *Building a Face Detection Attendance System • Deploying a Face Detection Web Application • Integrating Face Detection into Smart Home Systems • Course Wrap-Up & Future Learning Paths*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about t Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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