**1. Fundamentals of Computer Vision**

1. **What is computer vision?**
   * (A) A field of AI that enables machines to interpret and understand visual data. ✅
   * (B) A method of data encryption.
   * (C) A technique for converting images to sound.
2. **Which of the following are common image processing techniques?**
   * (A) Histogram equalization ✅
   * (B) Edge detection ✅
   * (C) Audio signal processing
3. **What is the purpose of a convolution operation in image processing?**
   * (A) To apply a filter that extracts features from an image. ✅
   * (B) To resize an image.
   * (C) To convert an image into a different format.
4. **What are common edge detection algorithms?**
   * (A) Canny ✅
   * (B) Sobel ✅
   * (C) K-means clustering
5. **Which of the following is a key difference between image processing and computer vision?**
   * (A) Image processing modifies images, while computer vision extracts meaningful information. ✅
   * (B) Computer vision only works on grayscale images.
   * (C) Image processing is a part of deep learning.

**2. Image Representation & Feature Extraction**

1. **What is an image histogram?**
   * (A) A graphical representation of pixel intensity distribution. ✅
   * (B) A method for detecting image features.
   * (C) A file format for storing images.
2. **Which color spaces are commonly used in computer vision?**
   * (A) RGB ✅
   * (B) HSV ✅
   * (C) PCM
3. **What is thresholding in image processing?**
   * (A) A technique that converts an image into binary based on pixel intensity. ✅
   * (B) A method for blurring an image.
   * (C) A data compression technique.
4. **What is morphological image processing used for?**
   * (A) Enhancing image structures using operations like erosion and dilation. ✅
   * (B) Creating 3D models from 2D images.
   * (C) Segmenting images into objects.
5. **What is the purpose of a Gaussian filter in image processing?**

* (A) To blur an image and reduce noise. ✅
* (B) To enhance edges.
* (C) To change image color channels.

**3. Feature Detection and Matching**

1. **What is a feature in computer vision?**

* (A) A distinctive pattern or structure in an image. ✅
* (B) A specific object detected in an image.
* (C) The size of an image file.

1. **Which of the following algorithms are used for feature detection?**

* (A) Harris Corner Detector ✅
* (B) SIFT (Scale-Invariant Feature Transform) ✅
* (C) Lempel-Ziv-Welch (LZW) compression

1. **What is the purpose of keypoint descriptors in computer vision?**

* (A) To describe features for matching across images. ✅
* (B) To compress an image.
* (C) To segment an image.

1. **What is the role of RANSAC in feature matching?**

* (A) To remove outliers in feature matches. ✅
* (B) To detect edges in an image.
* (C) To adjust image brightness.

1. **What is the ORB algorithm used for?**

* (A) A fast feature detection and description method. ✅
* (B) A technique for image compression.
* (C) A color correction method.

**4. Deep Learning in Computer Vision**

1. **What is a Convolutional Neural Network (CNN)?**

* (A) A deep learning model for analyzing images. ✅
* (B) A database for storing images.
* (C) A traditional machine learning algorithm.

1. **What are the key components of a CNN?**

* (A) Convolutional layers ✅
* (B) Pooling layers ✅
* (C) Fully connected layers ✅

1. **What is transfer learning?**

* (A) Using a pre-trained model for a new task. ✅
* (B) A method for resizing images.
* (C) A technique for image filtering.

1. **Which deep learning architectures are used for object detection?**

* (A) YOLO (You Only Look Once) ✅
* (B) Faster R-CNN ✅
* (C) K-means

1. **What is image segmentation?**

* (A) The process of dividing an image into meaningful parts. ✅
* (B) A method for detecting features in an image.
* (C) A file format for storing images.

**5. 3D Vision and Depth Estimation**

1. **What is stereo vision?**

* (A) A technique for estimating depth using two images. ✅
* (B) A method for converting color images to grayscale.
* (C) A data compression algorithm.

1. **What is a disparity map?**

* (A) A representation of depth differences between stereo images. ✅
* (B) A histogram of pixel intensities.
* (C) A method for matching features between two images.

1. **What is SLAM (Simultaneous Localization and Mapping)?**

* (A) A technique for mapping environments while tracking position. ✅
* (B) A file format for 3D images.
* (C) A color correction algorithm.

1. **Which sensor is commonly used for depth estimation?**

* (A) LIDAR ✅
* (B) RGB Camera
* (C) Microphone

1. **What is photogrammetry?**

* (A) Extracting 3D measurements from photographs. ✅
* (B) A technique for sharpening images.
* (C) A way to store images in databases.

**6. Applications of Computer Vision**

1. **What is facial recognition?**

* (A) Identifying individuals based on facial features. ✅
* (B) A method for tracking moving objects.
* (C) A technique for converting images to text.

1. **What is OCR (Optical Character Recognition)?**

* (A) A technology for extracting text from images. ✅
* (B) A method for detecting objects in images.
* (C) A way to compress image files.

1. **What is object tracking?**

* (A) Following a detected object over time in a video. ✅
* (B) Enhancing image quality.
* (C) Converting images into black and white.

1. **What is pedestrian detection used for?**

* (A) Identifying people in a scene, often used in surveillance. ✅
* (B) Enhancing contrast in images.
* (C) Encoding images in different formats.

1. **How is computer vision used in self-driving cars?**

* (A) Object detection ✅
* (B) Lane detection ✅
* (C) Obstacle avoidance ✅

**1. Fundamentals of Computer Vision**

1. **What is the main goal of computer vision?**
   * (A) Extract meaningful information from images/videos ✅
   * (B) Store large image datasets
   * (C) Generate new image file formats
2. **Which of the following are common computer vision tasks?**
   * (A) Object detection ✅
   * (B) Image classification ✅
   * (C) Audio signal processing
3. **What is a pixel in an image?**
   * (A) The smallest unit of an image ✅
   * (B) The entire image
   * (C) A compressed image format
4. **What is the purpose of a kernel in image processing?**
   * (A) A matrix used for filtering operations ✅
   * (B) A function for increasing resolution
   * (C) A technique for compressing images
5. **Which of the following are common edge detection algorithms?**
   * (A) Canny ✅
   * (B) Sobel ✅
   * (C) JPEG compression
6. **Which mathematical operation is used in convolution?**
   * (A) Element-wise multiplication and summation ✅
   * (B) Addition of all pixel values
   * (C) Averaging pixel values
7. **Which of the following techniques is used to remove noise from an image?**
   * (A) Gaussian blur ✅
   * (B) Bilateral filtering ✅
   * (C) Fourier transform
8. **Which of the following is NOT an image format?**
   * (A) PNG
   * (B) GIF
   * (C) WAV ✅
9. **What is the advantage of the HSV color space over RGB?**
   * (A) Better for color segmentation ✅
   * (B) Requires less storage
   * (C) Increases image resolution
10. **What is the role of thresholding in image processing?**

* (A) Convert grayscale images to binary ✅
* (B) Detect motion
* (C) Compress an image

**2. Feature Detection & Extraction**

1. **What is a keypoint in feature detection?**

* (A) A point in an image with a unique feature ✅
* (B) A region where color changes
* (C) The center of an image

1. **Which algorithms are used for feature detection?**

* (A) Harris Corner Detector ✅
* (B) SIFT (Scale-Invariant Feature Transform) ✅
* (C) RANSAC

1. **What does the ORB algorithm stand for?**

* (A) Oriented FAST and Rotated BRIEF ✅
* (B) Object Recognition Binary
* (C) Optical Recognition Benchmark

1. **What is a descriptor in feature matching?**

* (A) A numerical representation of a feature ✅
* (B) The size of an image
* (C) The color of a pixel

1. **What is a use case of the HOG (Histogram of Oriented Gradients) descriptor?**

* (A) Human detection ✅
* (B) Image compression
* (C) Noise removal

**3. Deep Learning for Computer Vision**

1. **What does CNN stand for?**

* (A) Convolutional Neural Network ✅
* (B) Computer Network Node
* (C) Conditional Neural Notation

1. **Which of the following are key layers in a CNN?**

* (A) Convolutional layer ✅
* (B) Pooling layer ✅
* (C) Fully connected layer ✅

1. **What is the main function of a ReLU activation function in CNNs?**

* (A) Introduce non-linearity ✅
* (B) Normalize pixel values
* (C) Reduce image resolution

1. **What is transfer learning?**

* (A) Using a pre-trained model on a new dataset ✅
* (B) Changing an image’s color channels
* (C) Encoding images into a new format

1. **Which deep learning models are used for object detection?**

* (A) YOLO (You Only Look Once) ✅
* (B) Faster R-CNN ✅
* (C) K-means

**4. Image Segmentation**

1. **What is the goal of image segmentation?**

* (A) Divide an image into meaningful regions ✅
* (B) Reduce image file size
* (C) Convert an image into grayscale

1. **Which algorithm is commonly used for semantic segmentation?**

* (A) U-Net ✅
* (B) YOLO
* (C) Harris Corner Detector

1. **What is instance segmentation?**

* (A) Identifies separate objects of the same class ✅
* (B) Detects motion in videos
* (C) Converts an image into 3D

1. **What is the difference between semantic and instance segmentation?**

* (A) Semantic segmentation groups objects of the same class together ✅
* (B) Instance segmentation detects individual objects ✅
* (C) They are the same technique

1. **Which of the following methods are used for image segmentation?**

* (A) Watershed algorithm ✅
* (B) GrabCut ✅
* (C) Fourier Transform

**5. Object Detection & Tracking**

1. **What is the main goal of object detection?**

* (A) Identify objects and their locations in an image ✅
* (B) Enhance image quality
* (C) Compress an image

1. **Which of the following object detection models is known for its speed?**

* (A) YOLO ✅
* (B) Faster R-CNN
* (C) ResNet

1. **What is non-maximum suppression (NMS) in object detection?**

* (A) Removes duplicate bounding boxes ✅
* (B) Increases image resolution
* (C) Detects edges in an image

1. **Which technique is commonly used for object tracking?**

* (A) Kalman filter ✅
* (B) Optical flow ✅
* (C) PCA

1. **What is the main challenge of multi-object tracking?**

* (A) Handling occlusions ✅
* (B) Increasing the number of objects
* (C) Image compression