

Maharaja Surajmal Institute of Technology , Janakpuri , New delhi

Department of Information Technology (2s)

Seminar Report

On

Digital Image Processing and OpenCV

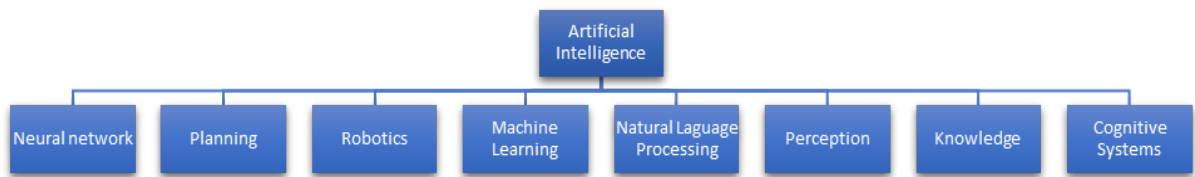
S.No.	Point Name	Description
1	Topic	Digital Image Processing and OpenCV
2	Expert Name	Mr. Sankar Ganesh
3	Activity Name	Webinar
4	Mode, Date & time	Online,12-09-2024, 3:00 PM - 4:00 PM
5	Target Audience	Final year students
6	Organized by	Dr. Minakshi Tomer (in collaboration with PanTech)
7	Attended Participants	Final year students(34)
8	Registration Form	https://forms.gle/AFDBvXt5dGDBnofW6

Pantech E-Learning and the Information Technology department of Maharaja Surajmal Institute of Technology organized an informative and skill-building webinar and workshop, allowing participants to explore several cutting-edge topics in Artificial Intelligence (AI) and related fields. The main focus of the seminar was on Digital Image Processing and OpenCV.

Topics Covered

1. Artificial Intelligence and Machine Learning

Participants learned about the fundamentals of AI and ML, including cognitive systems, neural networks, and machine learning algorithms. A visual representation illustrated key domains such as Cognitive Systems, Neural Networks, Planning, Robotics, Machine Learning, NLP, Perception, and Knowledge, all interconnected as pillars of AI.

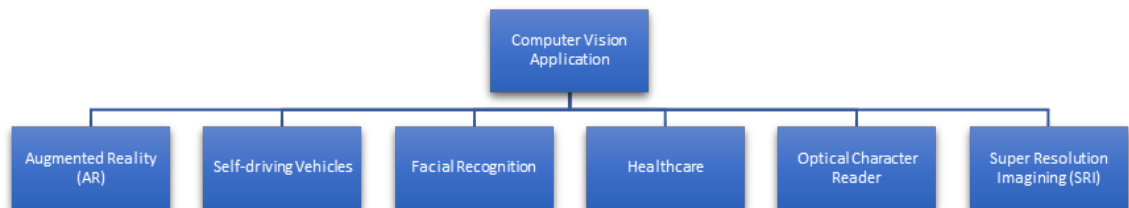


2. Deep Learning Techniques

Attendees explored how deep learning has revolutionized computer vision by enabling models to automatically learn and extract features from images without manual intervention, improving the accuracy and efficiency of tasks like image classification, object detection, and segmentation.

3. Computer Vision

This field of AI enables machines to interpret and understand visual information, much like human vision. It involves algorithms and models to process images or videos and extract meaningful information, with key tasks including image classification, object detection, image segmentation, and facial recognition.



4. Machine Vision

Machine vision technology captures and interprets visual information for industrial and automation purposes. It uses cameras, sensors, and computer algorithms for tasks like quality control, robotic guidance, and automated assembly, focusing on high-speed, high-accuracy applications.

5. Face Emotion Detection

Participants learned about facial emotion detection technology, which analyzes facial expressions to identify human emotions. This technology is utilized in customer experience analysis, mental health monitoring, and human-computer interaction, providing valuable insights into emotional states. Key steps for implementing face detection with OpenCV were discussed, including installation, loading classifiers, capturing images, and drawing bounding boxes around detected faces.

6. Cartoonifying Images

A demonstration showcased how an AI-driven tool processes an image to create a cartoon version. This process involves smoothing the image, enhancing edges, and reducing colors to achieve a simplified, hand-drawn appearance.

7. Natural Language Processing (NLP)

A session on NLP techniques covered how they enable machines to process and interpret human language, encompassing tasks such as language translation, sentiment analysis, and

chatbots. Techniques like machine learning and linguistic rules allow for valuable insights from unstructured text data.

8. **Digital Image Processing and OpenCV**

Attendees engaged in hands-on learning about digital image processing using OpenCV. The workshop covered various techniques for image enhancement, filtering, and analysis, emphasizing practical applications such as cartoonifying images.

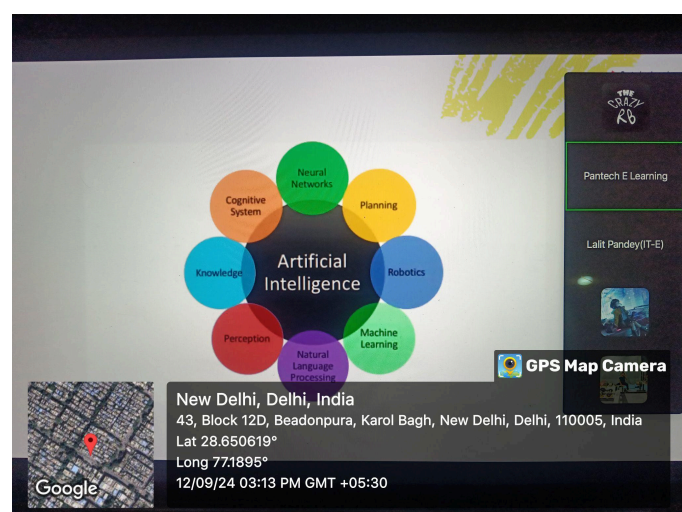
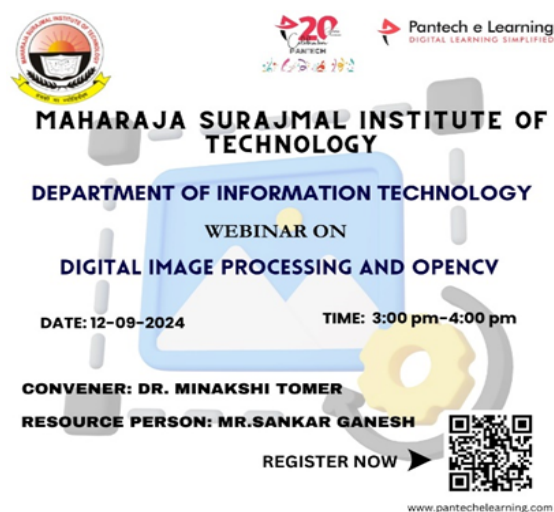
9. **Robotics and Autonomous Vehicles**

An introduction to robotics and autonomous vehicles highlighted how AI enables machines to perform tasks with minimal human intervention. This section covered autonomous driving technologies and robotic applications, including the use of computer vision and sensor fusion for navigation. These systems rely on a variety of technologies, including computer vision for object detection and environment mapping, sensor fusion to integrate data from cameras, LiDAR, and radar, and machine learning for decision-making and path planning.

Conclusion

The Pantech E-Learning Webinar and Workshop provided participants with a valuable platform to explore the dynamic fields of Artificial Intelligence, Digital Image Processing, and OpenCV. Led by expert Mr. Sankar Ganesh, the engaging sessions equipped attendees with insights into essential topics such as machine learning, deep learning techniques, computer vision, and natural language processing. Practical demonstrations, including face emotion detection and image cartoonification, showcased real-world applications, enhancing participants' understanding and skills. The discussion on robotics and autonomous vehicles underscored the transformative potential of AI across various industries, emphasizing the importance of continuous learning in an evolving technological landscape. Participants are encouraged to apply their newfound knowledge, explore these subjects further, and consider future professional development opportunities in AI and related fields.

Images of the webinar:



Machine Vision

input sensing device machine output

Human Vision

input sensing device machine output

GPS Map Camera

New Delhi, Delhi, India
2952.42 A, Sharma Electricals, Block 12D, Beadonpura, Karol Bagh, New Delhi, Delhi, 110005, India
Lat 28.650869°
Long 77.189298°
12/09/24 03:22 PM GMT +05:30

Human Vision System

Eye Brain

Computer Vision System

Eye Brain

GPS Map Camera

New Delhi, Delhi, India
2952.42 A, Sharma Electricals, Block 12D, Beadonpura, Karol Bagh, New Delhi, Delhi, 110005, India
Lat 28.650874°
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Face Emotion Detection

GPS Map Camera

New Delhi, Delhi, India
2952.42 A, Sharma Electricals, Block 12D, Beadonpura, Karol Bagh, New Delhi, Delhi, 110005, India
Lat 28.650869°
Long 77.189286°
12/09/24 03:29 PM GMT +05:30

Cartoonify image

GPS Map Camera

New Delhi, Delhi, India
2952.42 A, Sharma Electricals, Block 12D, Beadonpura, Karol Bagh, New Delhi, Delhi, 110005, India
Lat 28.650869°
Long 77.189286°
12/09/24 03:29 PM GMT +05:30

```
Python 3.12.1 (tags/v3.12.1:2305ca5, Dec 7 2023, 22:03:22) on win32
import cv2
img = cv2.imread('tiger.jpg')
cv2.imshow('tiger', img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

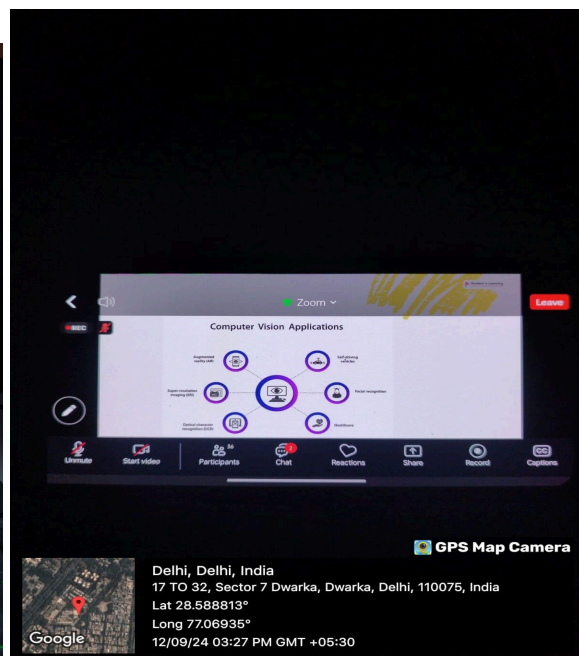
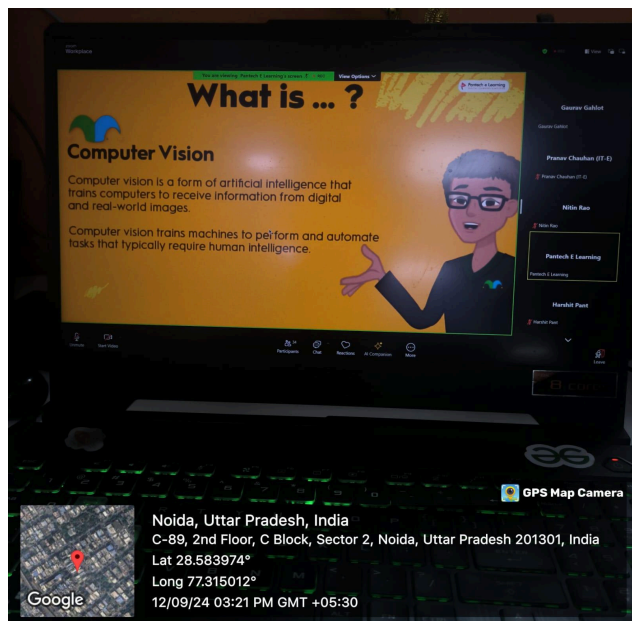
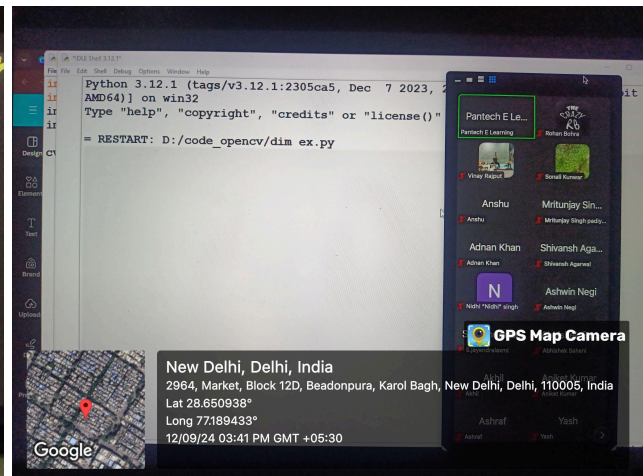
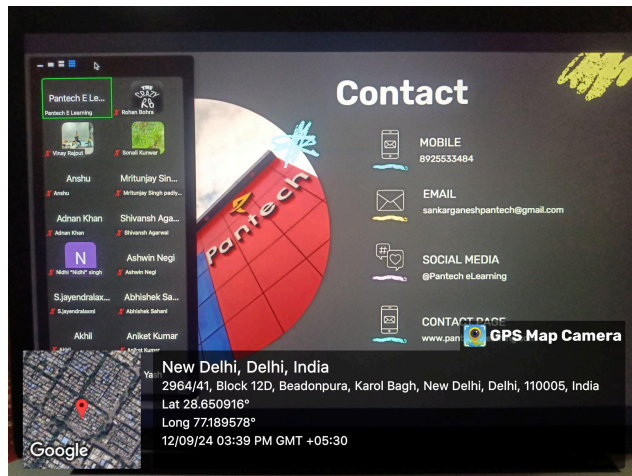
GPS Map Camera

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import cv2
img = cv2.imread('vegetables.jpg')
cv2.imshow('vegetables', img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

GPS Map Camera

New Delhi, Delhi, India
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Long 77.189448°
12/09/24 03:38 PM GMT +05:30



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