

# AI in Working with Images

Workshop #3



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WORKSHOPS FOR YOUNG PEOPLE “Technologies of tomorrow - combating disinformation and building security capacity in the use of artificial intelligence by young people” within the framework of the small-scale cooperation partnership project in the Youth sector of the Erasmus+ Program “Technologies of tomorrow - combating disinformation and building security capacity in the use of artificial intelligence by young people.”  
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# Agenda

1. Welcome and Introduction
2. Introduction to AI in Image Processing
3. Image Classification with Online Tools
4. Object Detection with Online Tools
5. Image Segmentation with Online Tools
6. Style Transfer with Online Tools
7. Generating Images with Online Tools
8. Q&A and Discussion



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# Introduction to AI in Image Processing



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# Introduction to AI in Image Processing

## What is Image Processing?

- AI in image processing involves the use of algorithms and machine learning to analyze and manipulate images.
- Key techniques include image classification, object detection, and image segmentation.
- Transformative applications in fields like healthcare, automotive, and entertainment.



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# Introduction to AI in Image Processing

## Key Applications in Everyday Life

- **Photo Editing:** AI-powered tools like Adobe Photoshop and smartphone apps enhance photos automatically.
- **Autonomous Vehicles:** AI helps in identifying obstacles and navigating roads.
- **Medical Imaging:** AI assists in diagnosing diseases by analyzing X-rays, MRIs, and CT scans.



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# Image Classification with Online Tools



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# Image Classification with Online Tools

## Basics of Image Classification

- Image classification refers to computer vision's ability to categorize and label groups of pixels or vectors within an image based on specific rules.
- **Use Cases:**
  - **Healthcare:** Identifying diseases from medical images.
  - **Retail:** Classifying products for inventory management.
  - **Social Media:** Tagging images to organize content.



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# Hands-on Activity: Using Teachable Machine



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# Using Teachable Machine

## Image Classification

- Access Teachable Machine: Go to Teachable Machine.
- Create a New Project: Click on "Get Started" and select "Image Project."
- Upload Images: Upload your dataset of images.
- Train the Model: Train your model by clicking on the "Train Model" button.
- Classify Images: Use the trained model to classify new images.
- Discussion: Review and discuss the classification results.

<https://teachablemachine.withgoogle.com>



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# Object Detection with Online Tools



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# Object Detection with Online Tools

## Understanding Object Detection

- Object detection involves identifying and labeling objects within an image.
- **Use Cases:**
  - **Security:** Monitoring surveillance footage for suspicious activity.
  - **Retail:** Detecting and counting products on shelves.
  - **Healthcare:** Detecting tumors or other anomalies in medical images.



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# Hands-on Activity: Using Astica AI



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# Using Astica AI

## Object Detection

- Access Astica AI: Go to Astica AI Object Detection.
- Upload an Image: Click on "Upload Image" and select an image file from your computer.
- Run Object Detection: The model will automatically detect and label objects in the image.
- Review Results: Analyze the detected objects and their accuracy.
- Discussion: Review and discuss the object detection results.



<https://astica.ai/vision/object-detection>



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# Image Segmentation with Online Tools



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# Image Segmentation with Online Tools

## Introduction to Image Segmentation

- Image segmentation involves partitioning an image into regions or sections that correspond to different objects or features.
- **Use Cases:**
  - **Healthcare:** Segmenting tumors or organs in medical images.
  - **Automotive:** Assisting autonomous vehicles in understanding road scenes.
  - **Agriculture:** Segmenting crops or animals in aerial images.



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# Hands-on Activity: Using Segment Anything



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# Using Segment Anything

## Image Segmentation

- Access Segment Anything: Go to Segment Anything.
- Upload an Image: Click on "Upload" and select an image for segmentation.
- Segmentation Tool: Use the provided tools to segment the image into different parts.
- Review Segmentation: Analyze the results of the segmentation.
- Discussion: Discuss the accuracy and usefulness of the segmentation results.

<https://segment-anything.com/demo>



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# Style Transfer with Online Tools



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# Style Transfer with Online Tools

## What is Style Transfer?

- Style transfer is a technique that combines the content of one image with the style of another image using neural networks.
- **Use Cases:**
  - **Art and Design:** Creating artwork by combining different styles.
  - **Entertainment:** Generating unique visual content.
  - **Marketing:** Designing visually appealing advertisements.



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# Hands-on Activity: Using Stylar AI



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# Using Stylar AI

## Style Transfer

- Access Stylar AI: Go to Stylar AI Style Transfer.
- Upload Content Image: Click on "Upload" to select the main image you want to transform.
- Choose Style Image: Select or upload the style image you want to apply.
- Generate Stylized Image: Click on "Generate" to create the new, stylized image.
- Review Results: Examine the produced image and evaluate its quality.
- Discussion: Discuss potential applications and share opinions on the results.

<https://www.stylar.ai/tools/style-transfer>



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# Generating Images with Online Tools



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# Generating Images with Online Tools

## Introduction to Generative Adversarial Networks (GANs)

- GANs are a class of machine learning frameworks designed to generate new data that mimics a given dataset.
- **Use Cases:**
  - **Content Creation:** Generating realistic images for movies and games.
  - **Data Augmentation:** Creating synthetic data to train other AI models.
  - **Research:** Exploring potential applications in fields like design and fashion.



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# Hands-on Activity: Using This Person Does Not Exist



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# Using This Person Does Not Exist

## Image Generation

- Access This Person Does Not Exist: Go to This Person Does Not Exist.
- Review Generated Images: Observe the AI-generated photographs of non-existent people.
- Evaluate Realism: Discuss how realistic these images appear.
- Potential Applications: Discuss possible uses for this technology and any ethical concerns.



<https://this-person-does-not-exist.com>



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# Discussion points

## Practical Applications and Use Cases

- **Healthcare:** Enhancing diagnostic accuracy and treatment planning.
- **Automotive:** Improving safety and efficiency in autonomous vehicles.
- **Entertainment:** Creating visually stunning movies and games.
- **Security:** Enhancing surveillance and monitoring systems.



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# Thank you



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