

DAILY ASSESSMENT FORMAT

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| Date: | 30/05/2020 | Name: | Prajwal Kamagethi Chakravarti P L |
| Course: | Python | USN: | 4AL17EC073 |
| Topic: | 1. Python for Image and Video Processing with OpenCV | Semester & Section: | 6 & B |
| Github Repository: | https://github.com/alvas-education-foundation/Prajwal-Kamagethi.git | | |

FORENOON SESSION DETAILS

Report – Report can be typed or hand written for up to two pages.

The screenshot shows a Udemy course page for 'The Python Mega Course: Build 10 Real World Applications'. The main video player displays a code editor with a file explorer on the left. The right sidebar shows the course content, including sections 221, 222, and 27 through 33. The bottom of the page shows a macOS dock with various application icons.

In this section,

Computer Vision can be defined as a discipline that explains how to reconstruct, interrupt, and understand a 3D scene from its 2D images, in terms of the properties of the structure present in the scene. It deals with modeling and replicating human vision using computer software and hardware.

Computer Vision overlaps significantly with the following fields –

- **Image Processing – It focuses on image manipulation.**
- **Pattern Recognition – It explains various techniques to classify patterns.**
- **Photogrammetry – It is concerned with obtaining accurate measurements from images.**

Computer Vision Vs Image Processing

Image processing deals with image-to-image transformation. The input and output of image processing are both images.

Computer vision is the construction of explicit, meaningful descriptions of physical objects from their image. The output of computer vision is a description or an interpretation of structures in 3D scene.

Robotics Application

- Localization – Determine robot location automatically
- Navigation
- Obstacles avoidance
- Assembly (peg-in-hole, welding, painting)
- Manipulation (e.g. PUMA robot manipulator)
- Human Robot Interaction (HRI) – Intelligent robotics to interact with and serve people

Medicine Application

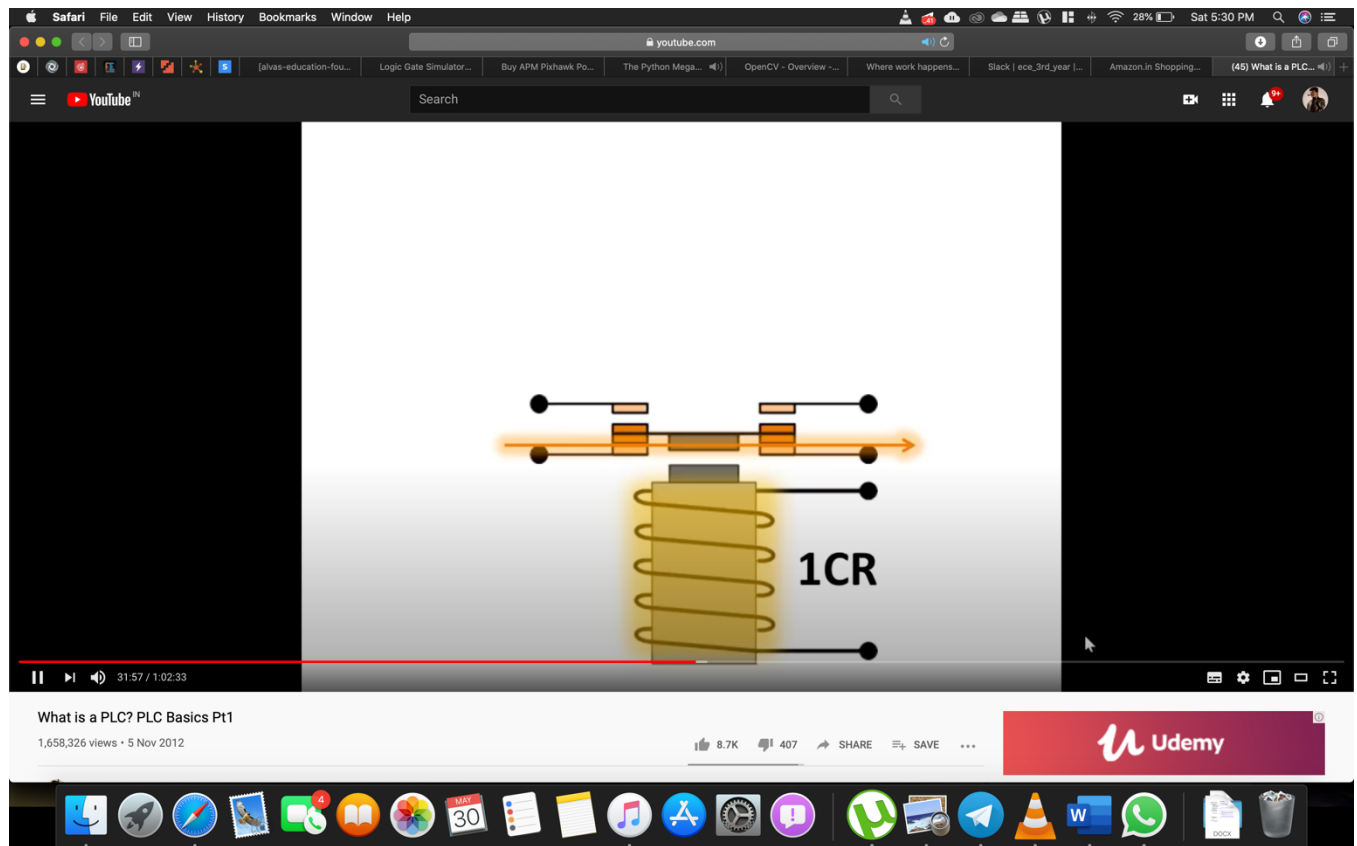
- Classification and detection (e.g. lesion or cells classification and tumor detection)
- 2D/3D segmentation
- 3D human organ reconstruction (MRI or ultrasound)
- Vision-guided robotics surgery

Features of OpenCV Library

Using OpenCV library, you can –

- Read and write images
- Capture and save videos
- Process images (filter, transform)
- Perform feature detection
- Detect specific objects such as faces, eyes, cars, in the videos or images.
- Analyze the video, i.e., estimate the motion in it, subtract the background, and track objects in it.

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| Date: | 30-05-2020 | Name: | Prajwal Kamagethi Chakravarti P L |
| Course: | Logic Design | USN: | 4AL17EC073 |
| Topic: | 1. Applications of Programmable logic controllers: | Semester & Section: | 6 TH & B |
| Github Repository: | https://github.com/alvas-education-foundation/Prajwal-Kamagethi.git | | |



Report:

In this section, the applications of PLC were discussed,

I/O – The PLC's CPU stores and processes program data, but input and output modules connect the PLC to the rest of the machine; these I/O modules are what provide information to the CPU and trigger specific results. I/O can be either analogue or digital; input devices might include sensors, switches, and meters, while outputs might include relays, lights, valves, and drives. Users can mix and match a PLC's I/O in order to get the right configuration for their application.

Communications – In addition to input and output devices, a PLC might also need to connect with other kinds of systems; for example, users might want to export application data recorded by the PLC to a supervisory control and data acquisition (SCADA) system, which monitors multiple connected devices. PLCs offer a range of ports and communication protocols to ensure that the PLC can communicate with these other systems.

Human Machine Interface (HMI) – In order to interact with the PLC in real time, users need an HMI. These operator interfaces can be simple displays, with a text-readout and keypad, or large touchscreen panels more similar to consumer electronics, but either way, they enable users to review and input information to the PLC in real time.

PLCs are used for continuously monitoring the input values from sensors and produces the outputs for the operation of actuators based on the program. Every PLC system comprises these three modules:

CPU Module

A CPU module consists of central processor and its memory. The processor is responsible for performing all the necessary computations and processing of data by accepting the inputs and producing the appropriate outputs.

Power Supply Module

This module supplies the required power to the whole system by converting the available AC power to DC power required for the CPU and I/O modules. The 5V DC output drives the computer circuitry.

I/O Modules

The input and out modules of the programmable logic controller are used to connect the sensors and actuators to the system to sense the various parameters such as temperature, pressure and flow, etc. These I/O modules are of two types: digital or analogue.

Communication Interface Modules

These are intelligent I/O modules which transfers the information between a CPU and communication network. These communication modules are used for communicating with other PLC's and computers, which are placed at remote place or far-off locate.

The program in the CPU of programmable logic controller consists of operating system and user programs. The purpose of the operating system with CPU is to deal with the tasks and operations of the PLC such as starting and stopping operations, storage area and communication management, etc. A user program is used by the user for finishing and controlling the tasks in automation.