A

MOOC based Seminar Report

On

**Introduction to Computer Vision and Image Processing**

**Name of website registered: https://www.coursera.org**

Submitted in partial fulfillment of the requirement Seminar for the Fourth Semester

**~~B.Tech (Branch)/M.Tech/ MCA/ MBA~~/ BCA/~~BBA/B.Com (Hons)~~**

By

**Name of the Student: Deepankar Sharma**

**University Roll No: 2092014**

**…**

**Under the Guidance of: Mrs. Manisha Koranga**

**Name of Faculty**

**Designation**

**Deptt. of CS&A**



**DEPARTMENT OF SCHOOL OF COMPUTING**

**GRAPHIC ERA HILL UNIVERSITY HALDWANI CAMPUS**

**BAREILLY ROAD, BERIPARAO, HALDWANI**

**DISTRICT- NAINITAL-263136**

**2021 - 2022**



**HALDWANI CAMPUS**

THIS IS TO CERTIFY THAT MR. / MS. **DEEPANKAR SHARMA** HAS SATISFACTORILY PRESENTED MOOC BASED SEMINAR. THE COURSE OF THE MOOC REGISTRATION **INTRODUCTION TO COMPUTER VISION AND IMAGE PROCESSING** IN PARTIAL FULLFILLMENT OF THE SEMINAR PRESENTATION REQUIREMENT IN **FOURTH** SEMESTER OF ~~B.TECH( ) / M.TECH( )~~ / **BCA** / ~~MCA / BBA / MBA~~ DEGREE COURSE PRESCRIBED BY GRAPHIC ERA HILL UNIVERSITY, HALDWANI CAMPUS DURING THE YEAR **2021- 2022**.

Campus MOOC-Coordinator Class Seminar Coordinator CONCERNED Mentor HOD

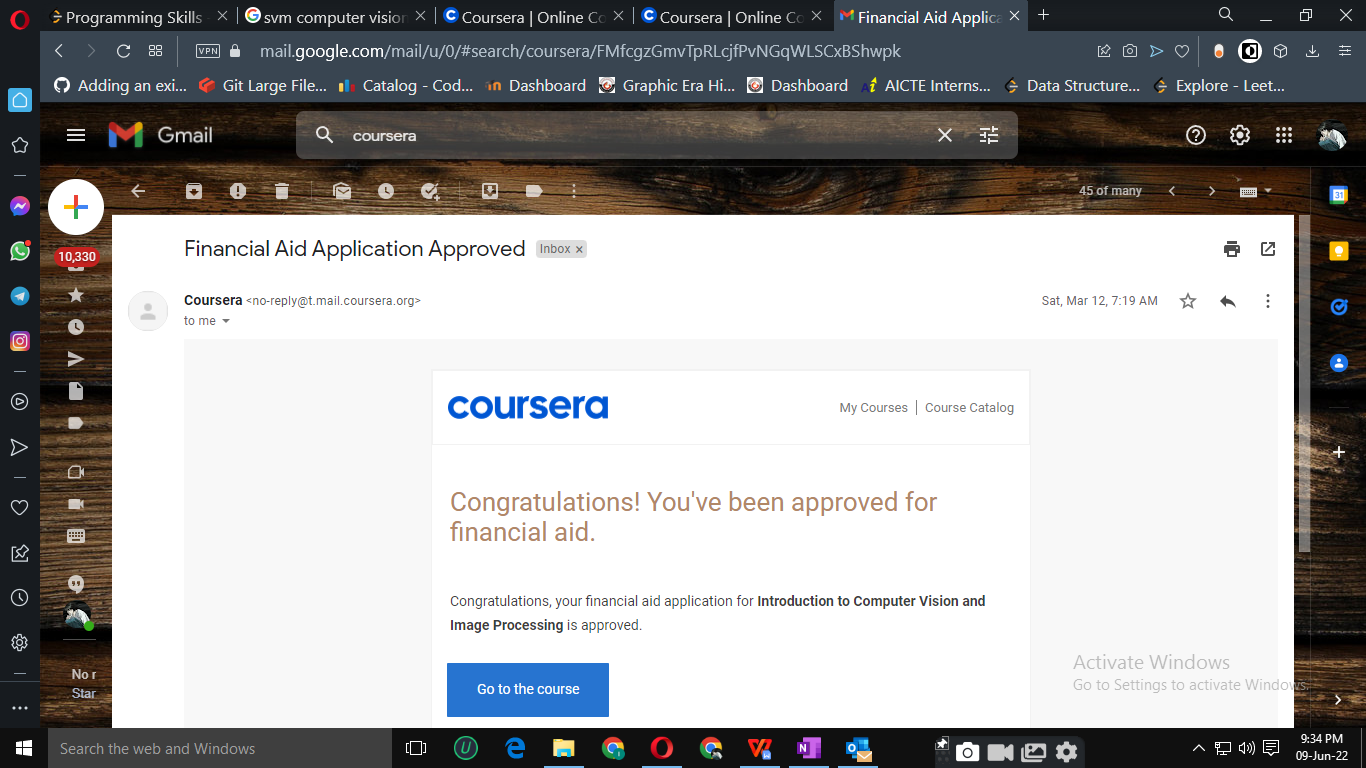
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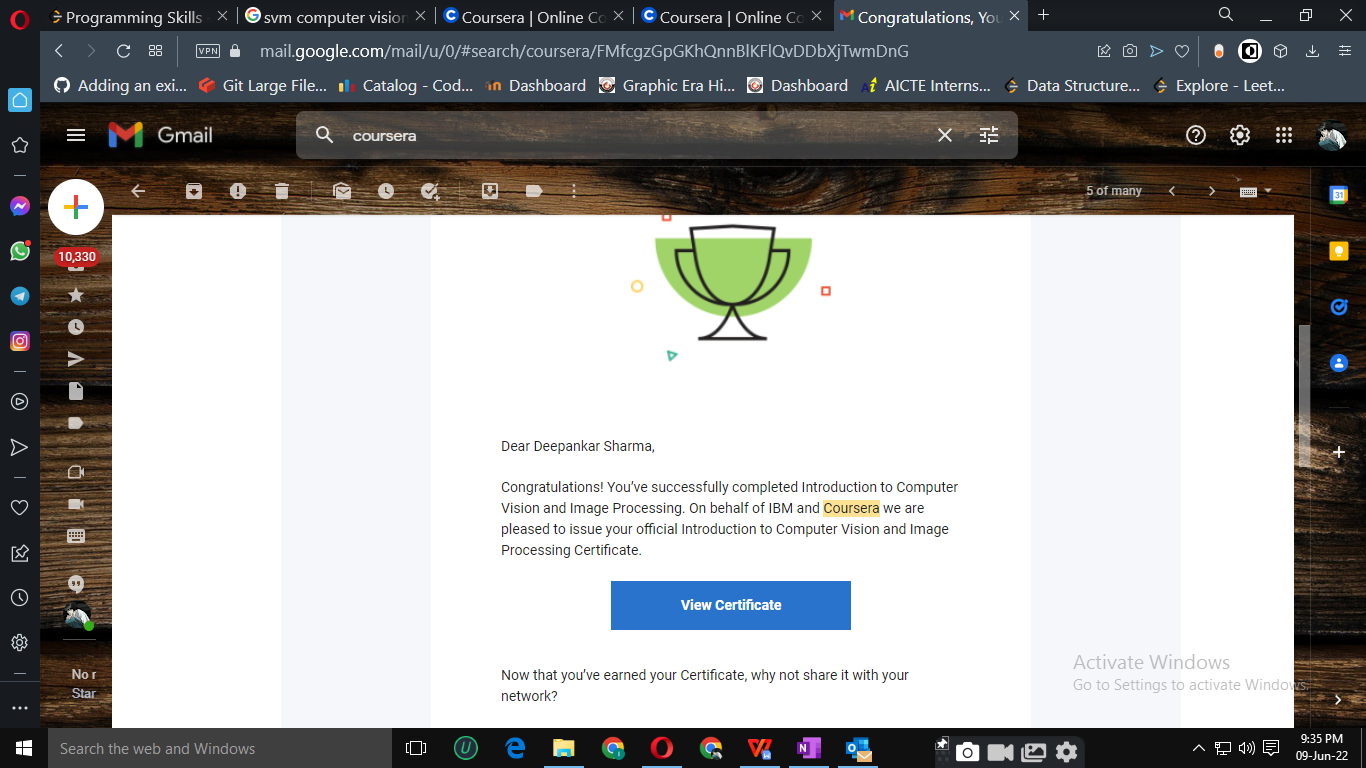
**Copy of confirmation Email of registration Received**





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**Copy of confirmation-Email of Course Completion Received**





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**Modules Attended**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S. NO.** | **DATE** | **Details of Modules Attended** | **PAGE NO.** | **Signature** |
| 1 | 22-03-2022 | Introduction to Computer Vision | 1 |  |
| 2 | 02-04-2022 | Image Processing with OpenCV and Pillow | 2 |  |
| 3 | 15-04-2022 | Machine Learning Image Classification | 3 |  |
| 4 | 27-04-2022 | Neural Networks and Deep Learning for Image Classification | 4 |  |
| 5 | 15-05-2022 | Object Detection | 5 |  |
| 6 | 29-05-2022 | Project Case: Not Quite a Self-Driving Car - Traffic Sign Classification | 6 |  |

ACKNOWLEDGEMENT

I take this opportunity to express my profound gratitude and deep regards to my teacher As. Prof. Manisha Koranga Ma’am.

For their exemplary guidance, monitoring and constant encouragement throughout the course of this report. The blessing, help and guidance given by them time to time shall carry me a long way in the journey of life on which I am about to embark.

Lastly, I thank almighty, my parents and friends for their constant encouragement without which this project would not be possible.

Name of Student

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**MODULE- 1**

**(Introduction to Computer Vision)**

**NAME OF STUDENT: DEEPANKAR SHARMA**

**COURSE: B.C.A**

**SEMESTER: 4TH**

**ROLL NO.: 2092014 (14)**

**DATE:22-03-2022**

**OBJECTIVE OF LEARNING:**

Discuss the rapidly developing field of image processing. In addition to being the first step in Computer Vision, it has broad applications ranging anywhere from making your smartphone's image look crystal clear to helping doctors cure diseases.

**LEARNING OUTCOME:**

1. Introduction to Computer Vision
2. Applications of Computer Vision
3. Recent Research in Computer Vision
4. Brainstorming Your Own Applications

**PROBLEMS FACED DURING LEARNING:**

1. Exploring the CV labs
2. Assignments

**POSSIBLE REMEDIES:**

1. Discussion Forums
2. We can email for technical glitches.

**FUTURE SCOPE:**

1. IBM Cloud credentials are very useful to learn
2. Computer vision is among the most progressive and rapidly growing fields.

**MODULE- 2**

**(Image Processing with OpenCV and Pillow)**

**NAME OF STUDENT: DEEPANKAR SHARMA**

**COURSE: B.C.A**

**SEMESTER: 4TH**

**ROLL NO.: 2092014 (14)**

**DATE:**

**OBJECTIVE OF LEARNING:**

Image processing enhances images or extracts useful information from the image. In this module, we learnt the basics of image processing with Python libraries OpenCV and Pillow.

**LEARNING OUTCOME:**

1. What Is A Digital Image
2. Manipulating Images
3. Pixel Transformations

**PROBLEMS FACED DURING LEARNING:**

1. LTI Item: Spatial Filtering Pillow
2. LTI Item: Spatial Filtering OpenCV
3. Practice Quiz: Practice Assessment
4. Exploring the CV labs
5. Assignments

**POSSIBLE REMEDIES:**

1. Discussion Forums
2. We can email for technical glitches.

**FUTURE SCOPE:**

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**MODULE- 3**

**(Machine Learning Image Classification)**

**NAME OF STUDENT: DEEPANKAR SHARMA**

**COURSE: B.C.A**

**SEMESTER: 4TH**

**ROLL NO.: 2092014 (14)**

**DATE:**

**OBJECTIVE OF LEARNING:**

In this module, we learnt about the different Machine learning classification Methods commonly used for Computer vision, including k nearest neighbours, Logistic regression, SoftMax Regression and Support Vector Machines. Finally, we learnt about Image features.

**LEARNING OUTCOME:**

1. Image Classification
2. Image Classification with KNN
3. Image Classification with Linear Classifiers
4. Image Classification with SVMs
5. Gradient Descent

**PROBLEMS FACED DURING LEARNING:**

1. Exploring the CV labs
2. Assignments
3. LTI Item: Image Classification with SVM and CV Studio
4. Practice Quiz: Practice Assessment

**POSSIBLE REMEDIES:**

1. Discussion Forums
2. We can email for technical glitches.

**FUTURE SCOPE:**

1. IBM Cloud credentials are very useful to learn

**MODULE- 4**

**(Neural Networks and Deep Learning for Image Classification)**

**NAME OF STUDENT: DEEPANKAR SHARMA**

**COURSE: B.C.A**

**SEMESTER: 4TH**

**ROLL NO.: 2092014 (14)**

**DATE:**

**OBJECTIVE OF LEARNING:**

In this module, we learnt about Neural Networks, fully connected Neural Networks, and Convolutional Neural Network (CNN). We learnt about different components such as Layers and different types of activation functions such as ReLU. We also get to know the different CNN Architecture such as ResNet and LenNet.

**LEARNING OUTCOME:**

1. Simple Neural Network for XOR
2. Fully Connected Neural Network Architecture
3. Convolutional Networks
4. CNN Architectures

**PROBLEMS FACED DURING LEARNING:**

1. Exploring the CV labs
2. Ungraded Plugin: Deploying a Model
3. LTI Item: Use CNN for "Hotdog, Not Hotdog" Classifier and Deploy Model with CV Studio
4. Practice Quiz: Practice Assessment
5. Assignments

**POSSIBLE REMEDIES:**

1. Discussion Forums
2. We can email for technical glitches.

**FUTURE SCOPE:**

1. IBM Cloud credentials are very useful to learn

**MODULE- 5**

**(Object Detection)**

**NAME OF STUDENT: DEEPANKAR SHARMA**

**COURSE: B.C.A**

**SEMESTER: 4TH**

**ROLL NO.: 2092014 (14)**

**DATE:**

**OBJECTIVE OF LEARNING:**

In this module, we learnt about object detection with different methods. The first approach is using the Haar Cascade classifier, the second one is to use R-CNN and MobileNet.

**LEARNING OUTCOME:**

1. Object Detection
2. Object Detection with Haar Cascade Classifier
3. Object Detection with Deep Learning

**PROBLEMS FACED DURING LEARNING:**

1. LTI Item: Object Detection with Faster R- CNN
2. LTI Item: Object Detection using Pre-trained Models CV Studio
3. Practice Quiz: Practice Assessment
4. Exploring the CV labs
5. Ungraded Plugin: Deploying a Model

**POSSIBLE REMEDIES:**

1. Discussion Forums
2. We can email for technical glitches.

**FUTURE SCOPE:**

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**MODULE- 6**

**(Project Case: Not Quite a Self-Driving Car - Traffic Sign Classification)**

**NAME OF STUDENT: DEEPANKAR SHARMA**

**COURSE: B.C.A**

**SEMESTER: 4TH**

**ROLL NO.: 2092014 (14)**

**DATE:**

**OBJECTIVE OF LEARNING:**

In the final week of this course, we build a computer vision app that we deployed on the cloud through Code Engine. For the project, we created a custom classifier, train it and test it on our own images.

**LEARNING OUTCOME:**

1. Implementing all what learnt so far

**PROBLEMS FACED DURING LEARNING:**

1. Ungraded Plugin: Project Overview
2. LTI Item: Task 1: Gather and Upload Your Data
3. Ungraded Plugin: Task 2: Train Your Classifier
4. Ungraded Plugin: Task 3: Deploy Your Model
5. Ungraded Plugin: Task 4: Test Your Classifier

**POSSIBLE REMEDIES:**

1. Discussion Forums
2. Took lots of Brain Storming
3. We can email for technical glitches.

**FUTURE SCOPE:**

1. IBM Cloud credentials are very useful to learn
2. Computer vision is among the most progressive and rapidly growing fields.