



South Indian Education Society's
GRADUATE SCHOOL OF TECHNOLOGY, Navi Mumbai.
DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

Applications of Machine Learning: Image Processing and Natural Language Processing

June 24 to June 29, 2024

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There is difference between education and knowledge. Education provides learning. While knowledge translates that learning into a career that earns a living. But the truth is, our education system is largely structured around academic learning, leaving the task of turning it into a career to the individual. For the less-privileged though, the only barrier that stands between them and a technocrat is knowledge of practical aspects of technology.

This course is meant to be a hands-on type of course, giving students a chance to learn python and applications of machine learning in image processing and natural language processing which is a current trend of technology.

About Instructors:

This course will be taught by a team of expert from Industry and SIESGST faculty members of the Electronics and Telecommunication Engineering Department.

Industry Expert:

Ms. Ekta Shah, Associate Data Scientist at MSCI

Ms. Pranita Mahajan, Sr. Data scientist at Relx-Elsevier

Faculty Members:

1. Dr. Swati Rane, Assistant Professor
2. Prof. Shyamala Mathi, Assistant Professor
3. Prof. Priyanka Kadam, Assistant Professor

Course Objectives:

Explain various libraries of python used in IP, NLP, ML
Explain basics of image processing
Implement basic image processing using python
Explain concepts of machine learning, NLP
Write codes of machine learning and NLP using python
Implement mini project based on image processing, NLP and machine learning using python

Course Outcomes:

Students will be able to

- Use Python – Jupyter tool
- Perform all basic operations in the Dataset and Visualize data using the libraries
- Perform operations of digital image processing and NLP using Python
- Implement classifier model for given data and compare its performance with another classifier.

Course Content:

Module	Contents	Hours
1.	Fundamentals of python programming: Introduction to Python, datatypes, NumPy, Pandas, Matplotlib, Seaborn, Open-CV, Sklearn, Scipy, Hands on exercises.	6 hrs
2.	Image processing using python: Introduction to digital image processing, image enhancement techniques, Image segmentation, morphological processing, image classification, object detection. Hands on exercises of all the concepts covered.	10 hrs
3.	Machine learning and applications: Basics of machine learning, simple linear regression, Multiple Linear Regression and Logistic Regression, K-NN, Decision tree algorithm, SVM classifier. Applications of ML in industry. Hands on exercises.	10 hrs
4.	Neural Networks: Basics of neural network, types of neural network, Image classifier model using ANN and CNN, Hands on exercises. Introduction to advanced neural networks.	10 hrs
5.	Natural Language Processing: Text Processing: Tokenization (word and sentence), Normalizing, Stemming, Lemmatization, Assignment. PoS: PoS tagging, PoS Tagging with Stop words, N-Gram, Text classification in NLP using machine learning	12 hrs

Assessment:

1. Module wise assignments and quizzes should be completed by students.
2. Mini Project should be completed at the end of the VAC.

Course Coordinator: Dr. Swati Rane
swatir@sies.edu.in
9324739106

Day wise schedule

Day	Activity
Day 1 24/6/2024	Introduction to Python, datatypes, Numpy, Python for Data Science – Pandas: Introduction to Pandas, Series, Dataframes – Missing Data, Groupby, merging, operations and Data i/p and o/p. Python for Data Visualization using Matplotlib and seaborn
	Exercise on Python, datatypes, Numpy, Pandas, Matplotlib and Seaborn
Day 2 25/6/2024	Introduction to digital image processing, image enhancement techniques, Image segmentation, morphological processing
	Exercise on Digital Image enhancement techniques, Image segmentation, morphological processing
Day 3 26/6/2024	Basics of machine learning, simple linear regression, Multiple Linear Regression and Logistic Regression
	Exercise on simple linear regression, Multiple Linear Regression and Logistic Regression
Day 4 27/6/2024	Decision tree algorithm, support vector machine, Exercise on Decision tree algorithm, support vector machine, Exercise on K-means algorithm and KNN algorithm
	Expert session by Ms. Ekta Shah, Associate Data Scientist at MSCI
Day 5 28/6/2024	Exercise on K-means algorithm and KNN algorithm
	Text Processing: Tokenization (word and sentence), Normalizing, Stemming, Lemmatization, Assignment
Day 6 29/6/2024	PoS: PoS tagging, PoS Tagging with Stop words, N-Gram,
	Text classification in NLP using machine learning
	Expert session by Ms. Ekta Shah, Associate Data Scientist at MSCI
29/06/24 to 6/07/24	Implementation of Miniproject
6/07/24 and 8/07/24	Miniproject presentation



SIES Graduate School of Technology
Sri Chandrasekarendra Saraswati Vidyapuram
Sector 5, Nerul, Navimumbai-400706

Department of Electronics and Telecommunication Engineering
Event Report

**Applications of Machine Learning:
Image Processing and Natural Language Processing
June 24 to June 29, 2024**

Event Information

Event Type: VAC

Event title: Applications of Machine Learning: Image Processing and Natural Language Processing

Resource Person: Dr. Swati Rane, Shyamala Mathi, Priyanka Kadam

Event date: from 24/06/2024 to 08/07/2024

Organized for: Students

Organized by: Department of Electronics and Telecommunication Engg

Target audience (branch & nos.):

**Attachments: 1. Photographs (in JPEG/PNG)
2. Attendance report
3. Feedback
4. Certificate**

Event Description

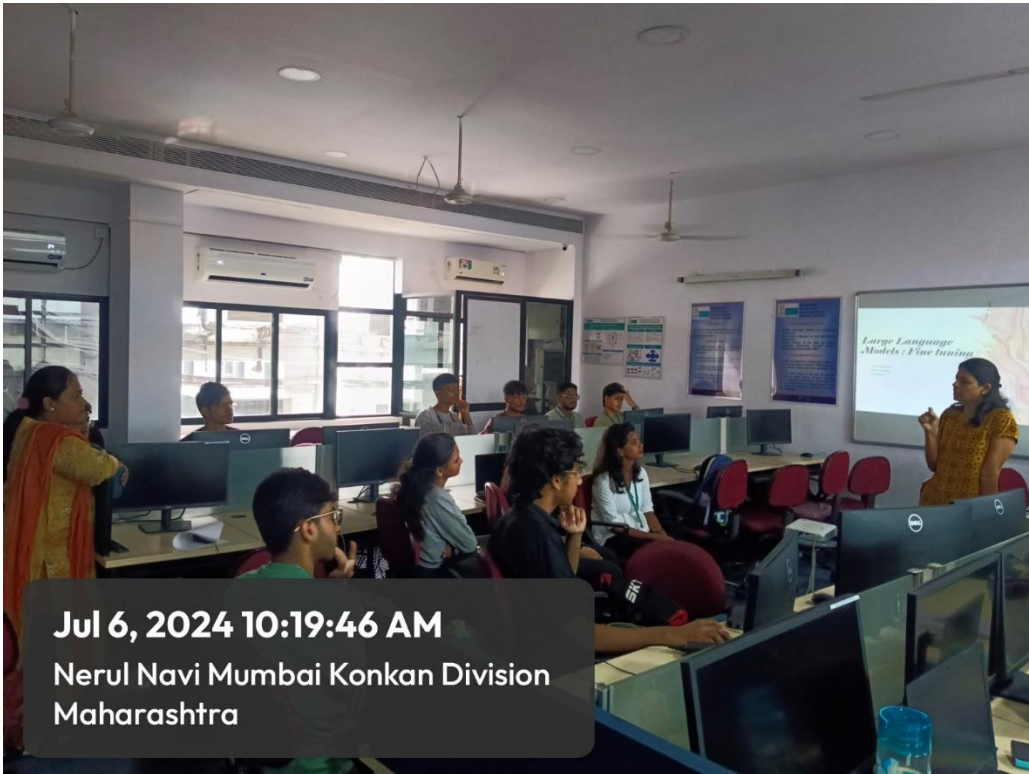
This course provides the broad introduction to the fundamentals of the Python programming language, Image Processing, Natural Language Processing and Machine Learning, along with programming best practices. It includes how to represent and store data using Python data types and variables, the power of complex data structures like lists, sets, dictionaries, and tuples to store collections of related data, write scripts & handle errors and how to use modules such as Numpy, Pandas, Matplotlib and Seaborn available in the Python Standard Library.

The field of image processing involves the use of computer algorithms to process images for analysis. Thus it also includes how to implement various Image enhancement and Image segmentation techniques using Open CV.

Computer vision has transformed the way we pursue digital image processing. Hence, Machine Learning is included in the course. The most effective machine learning techniques (Linear and Logistic Regression, SVM, Decision Tree, Random Forest, KNN and K-means algorithms), Deep Learning (CNN) are included and students will gain practice by implementing them using scikit-learn, tensor flow, and keras python modules.

1. Photographs (in JPEG/PNG)





Jul 6, 2024 10:19:46 AM
Nerul Navi Mumbai Konkan Division
Maharashtra



Jun 29, 2024 12:52:06 PM
Nerul Navi Mumbai Konkan Division
Maharashtra



2. Attendance report

SIES Graduate School of Engineering, Nerul										
Department of Electronics and Telecommunication										
Value Added Course on "Applications of Machine Learning - IP and NLP"										
Duration: 24th to 29th June 2024										
Attendance Sheet										
Sr. No.	Student Name	Mobile	Braenche	Class	24-06	25-06	26-06	27-06	28-06	29-06
1	Rishabh Soni	8828139264	AIDS	TE						
2	Ayaan Dwivedi	992026319	AIDS	TE						
3	Mihir Gyanesh Panpatil	7039630176	AIDS	TE						
4	Shrutishree Sampathkumar	9619689734	AIML	TE						
5	Yash Varma	8369146457	AIML	TE						
6	Sahil Powar	9930280177	AIML	SE						
7	Suthakar Anburaj	9321607843	CE	SE						
8	Aditya Mishra	8421730112	CE	SE						
9	Shankar	9136271704	CE	TE						
10	Antony Deon Machado	8591559844	CE	SE						
11	Aditya Pillai	8591577449	CE	SE						
12	Shravani Kerkar	7977565187	ECS	TE						
13	Tejraj Rajesh Gujar	8879414584	ECS	SE						
14	Harshad Dashrath jadhav	9321431218	ECS	FE						
15	Kartik Abhay Saynekar	8669130915	ECS	SE						
16	Sukanya Kailas Pawar	7977539779	EXTC	TE						
17	Payal Sanjay wagh	8591416391	EXTC	FE						

15	Kartik Abhay Saynekar	809130712	EXTC	TE																
16	Sukanya Kailas Pawar	7977539779	EXTC	FE																
17	Payal Sanjay wagh	8591416391	EXTC	FE																
18	Rima Jadhav	8591513213	EXTC	FE																
19	Varun Ubale	7400322723	EXTC	FE																
20	Prerna Rudra	8657638669	EXTC	SE																
21	Namrata chaurasia	7977717093	EXTC	SE																
22	Shreya Bhagwan Patil	08097684833	EXTC	SE																
23	Nidhi Hegde	7700966728	EXTC	FE																
24	Sakshi Janardan Thali	9321794231	EXTC	TE																
25	Janmanjay Verma	8928497368	EXTC	SE																
26	Khushi Jodha	9096351190	EXTC	FE																
27	Mukta somavanshi	7208408439	EXTC	FE																
28	Geetanshu kshatriya	7506579983	EXTC	FE																

29	Tanishq prakash Thorat	07304672595	EXTC	FE																
30	Tanmayi Nayak	9326369375	EXTC	SE																
31	RAJLEKHA BHOWMICK	7436932722	EXTC	SE																
32	Ritu Nair	9920401932	EXTC	FE																
33	shwet sanjaykumar kamble	8433762193	EXTC	FE																
34	Aryan Yadav	9869761416	EXTC	SE																
35	Smeet	865588540	EXTC	SE																
36	Sudepto ghosh	9967386288	EXTC	FE																
37	Altamash shaikh	8828076655	ME	BE																

Responses:

1	A	B	C	D	E	F	G
Timestamp	Name of the Student	Roll No.	Branch	Year	Email ID (SIES GST dom)	Mobile No.	
2	6/11/2024 19:26:55	Suthakar Anburaj	106 CE	SE	suthakarace122@gst.sie	9321607843	
3	6/12/2024 11:01:03	Shrutishree Sampathkurr	9058 AIML	TE	sampathkumarsaiml121@	9619689734	
4	6/15/2024 22:59:03	Sukanya Kailas Pawar	53 EXTC	TE	sukanyakpextc122@gst.	7977539779	
5	6/18/2024 9:56:54	Rishabh Soni	43 AIDS	TE	rishabhvsaid122@gst.si	8828139264	
6	6/19/2024 11:23:38	Altamash shaikh	21 ME	BE	altamashsme222@gst.s	8828076655	
7	6/19/2024 12:20:13	Payal Sanjay wagh	41 EXTC	FE	payalswextc123@gst.sie	8591416391	
8	6/19/2024 12:21:36	Rima Jadhav	15 EXTC	FE	rimajextc123@gst.sies.e	8591513213	
9	6/19/2024 16:10:45	Yash Varma	62 AIML	TE	yashgvaim122@gst.sies	8369146457	
10	6/19/2024 16:49:45	Varun Ubale	55 EXTC	FE	varunubale0507@gmail.	7400322723	
11	6/19/2024 19:57:46	Prerna Rudra	50 EXTC	SE	prernahextc123@gst.sie	8657638669	
12	6/19/2024 20:09:20	Namrata chaurasia	33 EXTC	SE	namratacextc123@gst.si	7977717093	
13	6/19/2024 20:17:09	Sahil Powar	35 AIML	TE	sahilspaim123@gst.sies	9930280177	
14	6/19/2024 20:24:02	Shreya Bhagwan Patil	38 EXTC	SE	patilshreya145@gmail.c	08097684833	
15	6/19/2024 20:51:37	Nidhi Hegde	11 EXTC	FE	nidhichextc123@gst.sies	7700966728	
16	6/20/2024 10:01:51	Sakshi Janardan Thali	44 EXTC	TE	sakshijtextc122@gst.sie	9321794231	
17	6/20/2024 10:17:11	Janmanjay Verma	17 EXTC	SE	janmanjaykvextc123@gs	8928497368	
18	6/20/2024 11:38:22	Avaan Dwivedi	19 AIDS	TE	avaanrdaids122@gst.sie	9920263319	
21	6/20/2024 14:03:38	Geetanshu kshatriya	27 EXTC	FE	geetanshugextc123@g	7506579983	
22	6/20/2024 14:55:08	Tanishq prakash Thorat	54 EXTC	FE	tanishqptextc123@gst.sie	07304672595	
23	6/20/2024 21:30:41	Tanmayi Nayak	34 EXTC	SE	Tanmayisnextc123@gst.	9326369375	
24	6/20/2024 22:34:58	Shravani Kerkar	1227049 ECS	TE	shravanickecs122@gst.s	7977565187	
25	6/21/2024 16:32:50	Aditya Mishra	62 CE	SE	adityabmce123@gst.sies	8421730112	
26	6/21/2024 17:15:58	Shankar	86 CE	TE	shankargyce122@gst.sie	9136271704	
27	6/21/2024 18:52:11	Antony Deon Machado	9 CE	SE	deonamce123@gst.sies.	8591559844	
28	6/22/2024 16:03:49	Tejraj Rajesh Gujar	17 ECS	SE	tejrajrgecs123@gst.sies.	8879414584	
29	6/22/2024 18:05:32	RAJLEKHA BHOWMICK	46 EXTC	SE	rajlekhabextc123@gst.si	7436932722	
30	6/22/2024 18:33:55	Ritu Nair	49 EXTC	FE	riturnextc123@gst.sies.e	9920401932	
31	6/22/2024 22:20:57	Harshad Dashrath jadhav	20 ECS	FE	harshadjecs123@gst.si	9321431218	
32	6/23/2024 0:26:22	shwet sanjaykumar kamt	24 EXTC	FE	shwetskextc123@gst.sie	8433762193	
33	6/23/2024 10:41:16	Aryan Yadav	59 EXTC	SE	aryanryextc123@gst.sies	9869761416	
34	6/23/2024 12:22:50	Smeet	52 EXTC	SE	Smeetspextc123@gst.sie	865588540	
35	6/23/2024 18:19:24	Kartik Abhay Saynekar	44 ECS	SE	kartikasecs123@gst.sies	8669130915	
36	6/23/2024 19:54:35	Aditya Pillai	10 CE	SE	adityarpc122@gst.sies.	8591577449	
37	6/23/2024 20:05:48	Sudepto ghosh	09 EXTC	FE	sudeeptolgextc123@gst.	9967386288	

3. Feedback

A	B	C	D	E	F	G	H
ID	Start time	Completion time	Email	Name	Full Name	Completion	Department
1	7-6-24 11:25:40	7-6-24 11:27:19	prernahrextc123@gst.	PRERNA RUDRA	Prerna Rudra	123A2052	EXTC
2	7-6-24 11:46:56	7-6-24 11:49:23	sudeeptolgextc123@g	SUDEEPTO GHOSH	Sudepto ghosh	123A2010	EXTC
3	7-6-24 11:50:06	7-6-24 11:56:16	varunmuextc123@gst.	VARUN UBALE	Varun Ubale	123A2057	EXTC
4	7-6-24 23:13:49	7-6-24 23:16:48	harshadjecs123@gst.	HARSHAD JADHAV	Harshad Dashrath jadh	123A7020	ECS
5	8-12-24 15:49:09	8-12-24 15:51:12	adityabmce123@gst.si	ADITYA MISHRA	Aditya Mishra	123A1066	CE
6	8-12-24 15:50:11	8-12-24 15:51:19	shankargyce122@gst.s	SHANKAR YADAVA	Shankar Ganesh	122A1086	CE
7	8-12-24 16:12:03	8-12-24 16:17:41	payalswextc123@gst.s	PAYAL WAGH	Payal wagh	123A2043	EXTC
8	8-12-24 16:38:45	8-12-24 16:41:14	janmanjaykvextc123@	JANMANJAY VERMA	janmanjay verma	123A2018	EXTC
9	8-12-24 18:15:14	8-12-24 18:16:42	geetanshugkextc123@	GEETANSHU KSHATRIY	Geetanshu kshatriya	123A2028	EXTC
10	8-12-24 18:53:59	8-12-24 18:54:56	mihirgpaid122@gst.si	MIHIR PANPATIL	Mihir Panpatil	122A8036	AIDS
11	8-13-24 15:51:28	8-13-24 15:52:37	sampathkumarsaiml12	Sampathkumar Shruti	Shrutishree Sampathk	121A9058	AIML
12	8-13-24 16:43:18	8-13-24 16:45:23	tanmayisnextc123@g	TANMAYI NAYAK	Tanmayi Nayak	123A2035	EXTC
13	8-13-24 19:08:37	8-13-24 19:20:20	rimajextc123@gst.sies	RIMA JADHAV	Rima Jadhav	123A2016	EXTC
14	8-14-24 13:49:58	8-14-24 13:50:59	aryanryextc123@gst.si	ARYAN YADAV	Aryan yadav	123A2061	EXTC