



The Gujarat Council on Science and Technology (GUJCOST)

Sponsored

One Week Faculty Development Program

on

“Research Applications in Artificial Intelligence and Machine Learning”

(24th – 28th June, 2019)

(GUJCOST/Seminar Grant/2415/2019-20/813)

Organized By



in Association with

Computer Society of India (CSI)

Indian Society for Technical Education (ISTE)

Program Coordinator

Mr. Vishvajit Bakarola

Assistant Professor,
Computer Engineering & Information Technology Department,
C. G. Patel Institute of Technology, Bardoli

Convener

Ms. Purvi Tandel

Head of Computer Engineering & Information Technology Department
C. G. Patel Institute of Technology, Bardoli

About Program

The primary objective of this one-week Faculty Development Program (FDP) on Research Applications in Artificial Intelligence and Machine Learning was to enrich faculty members of Computer Science stream with preliminaries of artificial intelligence and its modern applications in machine learning and deep learning. The FDP was divided into several modules falling under the umbrella of Artificial Intelligence including Machine Learning, Deep Learning, Data Science, Natural Language Processing and Digital Image Processing. The objective was to address modern trends in the field of Artificial Intelligence with real time problem solving. This FDP focused on hands-on implementation of various algorithms to deliver practical skill to participants.

Date: 24th– 28th June, 2019

Time: 09:30 AM to 04:00 PM (Monday – Friday)

Venue: M.Sc (IT) LAB, 1st Floor, D-Wing (103), CGPIT

Coordinator: Mr. Vishvajit Bakarola (Department of Computer Engineering & Information Technology)

Organizing Committee:

- 1) Mr. Sapan Naik (Assistant Professor)
- 2) Ms. Mithila Sompura (Assistant Professor)
- 3) Ms. Krishna Patel (Assistant Professor)

Technical Committee:

- 1) Mr. Fenil Khatiwala (Assistant Professor)
- 2) Mr. Parth Shah (Assistant Professor)

Targeted Audience:

- 1) Faculty members from various academic institutes/universities
- 2) Research Scholars
- 3) Industry Personnel

No. of Participants:

- 1) Academician – 22
- 2) Industry Person - 02

FDP Banner



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One Week
Faculty Development Programme on

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Artificial Intelligence and Machine Learning**

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Coordinators	Organizing Committee	Technical Committee
Ms. Kinjal Mistree	Mr. Sapan Naik	Mr. Fenil Khatiwala
Mr. Vishvajit Bakarola	Ms. Mithila Sompura	Mr. Parth Shah
	Ms. Krishna Patel	



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**Chhotubhai Gopalbhai Patel
Institute of Technology**

Speaker Profile



Prof. (Dr.) Amit
Ganatara

Prof. Amit Ganatara has more than 20 years of experience in academics. He is currently working as a Professor and dean in C. S. Patel Institute of Technology, Charusat, Changa. He is having wide experience in the field of data science and machine learning. His research interest covers vast range of domains including Data mining, Cloud computing, Artificial Intelligence, Machine Learning, Soft computing.



Prof. (Dr.) Mukesh
Zaveri

Prof. Mukesh Zaveri has vast experience in the field of computer science and electronics engineering. He has pursued his Ph.D. from IIT Bombay. His research interest covers Computer vision, Image processing, Audio-speech processing, Machine learning, Wireless sensor networks and Internet of Things. He is currently working as a Head at Department of Computer Engineering, Sardar Vallabhbhai Patel National Institute of Technology, Surat.



Prof. (Dr.) Mehul S.
Raval

Prof. Mehul Raval has more than 15 years of experience as a researcher. Prof. Raval is Joint secretary of IEEE Gujarat section, Senior member of CSI. He has pursued his Doctorate from Pune University, Maharashtra. He is currently working as a Professor at Pandit Dindayala Upadhyay University, Gandhinagar, Gujarat.



Prof. (Dr.) Mayuri
Mehta

Prof. Mayuri Mehta has more than 10 years of experience as an academican. She pursued her doctoral research from SVNIT, Surat. She is currently working as a Professor in Department of Computer Engineering, Sarvajanik College of Engineering and Technology, Surat. Her major research interests are in High performance computing, Data science, Machine learning, Deep learning, Algorithms and Genetic algorithms.



Prof. (Dr.) Brijesh S.
Bhatt

Dr. Brijesh Bhatt has more than 16 years of experience and currently working as an Associate Professor, in department of computer engineering, Dharamsinh Desai University, Nadiad. He has pursued his Ph.D. from IIT, Bombay. His major research interest is in Natural Language Processing and Artificial Intelligence.



Prof. (Dr.) Devang
Pandya

Dr. Devang Pandya is an Assistant Professor in Information and Communication Technology at AIIE since April 2018. He has 18 years of academic experience. He has been invited as an expert/Resource person at various Engineering colleges. He is a life time member of ISTE and IETE. His major research interest is in Artificial Intelligence, Image Processing, Statistics, Algorithm Analysis, Information Security, and Information Retrieval.

Day 1 – 24th June 2019: Prof. (Dr.) Amit Ganatra

Session 1: Hands on - Programming with Python

Python is a general purpose and high level programming language. We can use Python for developing desktop GUI applications, websites and web applications. Also, Python, as a high level programming language, allows you to focus on core functionality of the application by taking care of common programming tasks. The simple syntax rules of the programming language further makes it easier for us to keep the code base readable and application maintainable.

To make audience aware with python programming, hands-on session was arranged on first day of FDP. The session was conducted by Assistant Prof. Kinjal Mistree and Assistant Prof. Fenil Khatiwala, CE & IT Department, CGPIT. They covered basic functionalities and libraries of python.

Session 2: Research Scopes and Recent Trends in Artificial Intelligence and Machine Learning

In the session on Research Scopes and Recent Trends in Artificial Intelligence and Machine Learning, Dr. Amit Ganatra sir covered overview and applications of deep learning. He explained that the exponential growth of business data, low-cost data storage, and Artificial Intelligence reaching maturity will lead to more businesses outsourcing their data center enter activities to cloud service providers. Also, the future of Machine Learning and Artificial Intelligence explains that while cloud brings agility to businesses, AI and ML will leave a major impact on business outcomes.



Dr. Amit Ganatra delivering session

He explained significance of easy availability of both live and dead business data that will contribute towards the creation of better Machine Learning models and algorithms. Also, wearable devices and the development of intelligent apps will rise in tandem, with the increasing rise of mobile consumers. The use of Natural Language Processing (NLP) will rise significantly in customer-service functions that require text processing at scale.

Session 3: Foundation of Machine Learning

Machine learning can be broadly defined as computational methods using experience to improve performance or to make accurate predictions. Here, experience refers to the past information available to the learner, which typically takes the form of electronic data collected and made available for analysis. This data could be in the form of digitized human-labeled training sets, or other types of information obtained via interaction with the environment. In all cases, its quality and size are crucial to the success of the predictions made by the learner.



Dr. Amit Ganatra with Dr. R V Patil

In the post lunch session Dr. Amit Ganatra sir briefed about basics of Neural networks. The speaker also covered layers of NN, with functioning of all the individual layers. He gave the information about preliminary need of hidden layer and the change in result by varying input of hidden layer. Moreover the speaker had shown working of different functionalities in Oragne and WEKA tools. At the end of session he discussed various research applications with the participants.



Dr. Amit Ganatra with Dr. R V Patil and FDP organizing team

Day 2 – 25th June 2019: Prof. (Dr.) Devang Pandya

Session 1 & 2: Machine Learning algorithms for Data Science

Machine learning is used to predict, categorize, classify, finding polarity from the given datasets and concerned with minimizing the error. It uses training data for artificial intelligence.

Since there are many algorithms like SVM, Bayes algorithm, logistic regression, etc. which use training data to match with input data and then they provide conclusion with maximum accuracy.

To make participants aware with various popular machine learning algorithms, Dr. Devang Pandya conducted session with introduction of image processing, various tools and techniques to work with image processing. After introduction, he explained how to work with NumPy with basic calculations. The participants

performed hands on NumPy. Moreover the speaker taught how to solve real time problems efficiently using machine learning algorithms.



Dr. Devang Pandya with participants



Dr. Devang Pandya delivering session



Dr. Devang Pandya with participants and FDP organizing team



Dr. Devang Pandya with Dr. R V Patil and FDP organizing team

Day 3 – 26th June 2019: Prof. (Dr.) Mukesh Zaveri, Prof. (Dr.) Mayuri Mehta

Session 1: Machine Learning Classifiers

In machine learning and statistics, classification is a supervised learning approach in which the computer program learns from the data input given to it and then uses this learning to classify new observation. This data set may simply be bi-class (like identifying whether the person is male or female or that the mail is spam or non-spam) or it may be multi-class too.

After giving introduction to all types of machine learning classifiers, Dr. Mukesh Zaveri summarized mathematical representation of linear classification, regression with applications.



Dr. Mukesh Zaveri delivering session on Support Vector Machines



Dr. Mukesh Zaveri with Dr. R V Patil

Session 2: TensorFlow: A Platform to Build ML/DL Models

Google's TensorFlow is an open-source and most popular deep learning library for research and production. It covers basics to advance topics like linear regression, classifiers, create, train and evaluate a neural network like CNN, RNN, auto encoders etc.

In the second session of third day, Dr. Mayuri Mehta started with basics of Machine Learning. She explained how TensorFlow and NumPy are used with research applications. She explained how to define rank and shaper of tensor.

After introduction to Tensorflow, she conducted practical session on steps of installing anaconda software in Linux OS. She covered commands to create private virtual environment with a specific package and version. The basic examples to work with TensorFlow with Regression and Tensorboard were also covered.



Dr. Mayuri Mehta delivering session on Tensorflow



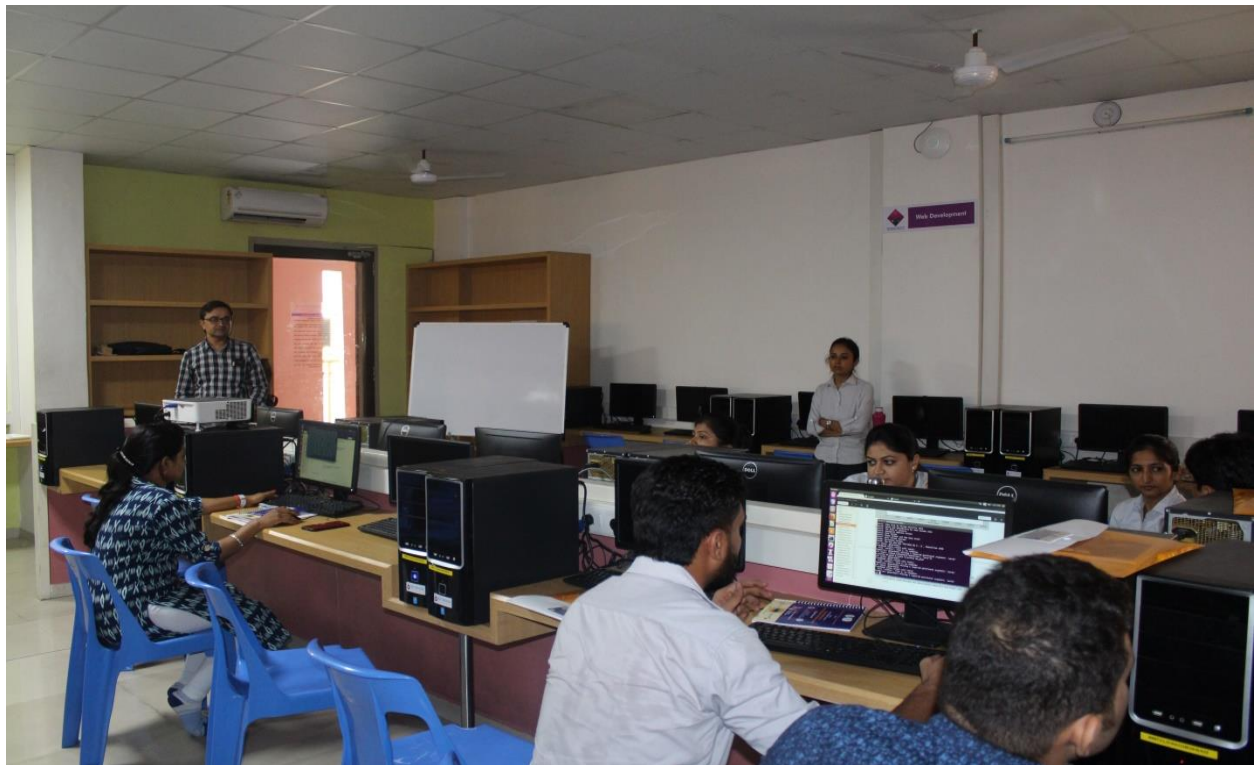
Dr. Mayuri Mehta with Dr. R V Patil and FDP organizing team

Day 4 – 27th June 2019: Prof. (Dr.) Brijesh Bhatt

Session 1: Natural Language Processing for Machine Learning

Natural language processing is a field in machine learning with the ability of a computer to understand, analyze, manipulate, and potentially generate human language.

To introduce research scope and recent trends in NLP, in the first session of fourth day, Dr. Brijesh Bhatt adumbrated basic preliminary of intelligence computing, belief and reasoning. He also covered different stages of NLP and their use in real time applications.



Dr. Brijesh Bhatt delivering session on NLTK



Dr. Brijesh Bhatt with participants and FDP organizing team

Session 2: Hands On with NLTK

NLTK provides practical introduction to programming for language processing. Written by the creators of NLTK, it guides the reader through the fundamentals of writing Python programs, working with corpora, categorizing text, analyzing linguistic structure, and more.

In post session, Dr. Brijesh Bhatt had shown practical demonstration of statistic translation and syntax processing stage.



Dr. Brijesh Bhatt with Dr. R V Patil and FDP organizing team

Day 5 – 28th June 2019: Prof. (Dr.) Mehul Raval

Session 1: Soft biometrics for person retrieval in unconstrained surveillance videos

In this session, Dr. Mehul Raval covered a practical demonstration of how to divide frame from live video. He also explained the efficiency of recognizing human with and without artificial intelligence. As a result after applying artificial intelligence algorithm the result outperforms.



Dr. Mehul Raval delivering session

Session 2: Soft biometrics for person retrieval in unconstrained surveillance videos

In post session Dr. Mehul Raval demonstrated real time project of recognizing human from live video.



Group photo with expert, coordinators and participants

The day ended with certificate distribution to the participants. Dr. Rajkumar Patil, Director, of C. G. Patel Institute of Technology and Dr. Mehul Raval, resource person of fifth day distributed certificates to participants. Participants gave oral and

written feedbacks about overall conduction and usefulness of course content. The programme concluded with thanksgiving note by Dr. R V Patil.



Certificate distribution to participants

Feedback Analysis

Questions	NA	Poor	Fair	Good	Very Good	Excellent
Information imparted in the program	-	-	-	5	7	12
Course Contents	-	-	-	3	11	10
Usefulness of Course Contents in practical use	-	-	-	2	8	13
Knowledge about subject						
Prof. (Dr.) Amit Ganatra	-	-	-	-	4	18
Dr. Devang Pandya	-	-	-	2	7	15
Prof. (Dr.) Mukesh Zaveri	-	-	-	-	10	14
Prof. (Dr.) Mayuri Mehta	-	-	-	-	5	19
Dr. Brijesh Bhatt	-	-	-	3	3	18
Prof. (Dr.) Mehul Raval	-	-	-	1	9	14
Presentation Methods						
Prof. (Dr.) Amit Ganatra	-	-	-	-	8	6
Dr. Devang Pandya	-	-	-	1	12	11
Prof. (Dr.) Mukesh Zaveri	-	-	-	5	6	13
Prof. (Dr.) Mayuri Mehta	-	-	-	-	5	19
Dr. Brijesh Bhatt	-	-	-	2	7	15
Prof. (Dr.) Mehul Raval	-	-	1	1	7	15
Level of Instructions						
Prof. (Dr.) Amit Ganatra	-	-	-	5	5	14
Dr. Devang Pandya	-	-	-	3	6	13
Prof. (Dr.) Mukesh Zaveri	-	-	1	3	5	15
Prof. (Dr.) Mayuri Mehta	-	-	1	4	4	15
Dr. Brijesh Bhatt	-	-	1	4	4	15

Prof. (Dr.) Mehul Raval	-	-	1	5	7	11
Relevance of training to participants	-	-	-	3	9	12
Quality of food	-	-	-	4	7	13
Overall Grading of the program(Timeliness)	-	-	-	2	6	16
Overall Grading of the program(Relevance)	-	-	-	1	6	17
Overall Grading of the program(Effectiveness)	-	-	-	3	5	16

Note: The feedback analysis count shows the number of participants evaluated various questionnaire.