Sarvajanik Education Society
Sarvajanik College of Engineering & Technology, Surat.
Masters in Computer Applications Department
Academic Year 2020-2021

Report of Joint AICTE- GTU Faculty Development Program
On
Natural Language Processing and Deep Learning: Trends and Applications (NLPDL - TA)
(Online Mode)

Details of the FDP

Date and Time:	1st March 2021 to 6th March 2021 (9:00 AM to 4:00 PM)
Venue:	Online (Google Meet)
Targeted Audience	Faculty members of institutes affiliated to GTU
Coordinated By:	Prof. Kaushika Pal
Organized By	MCA Department, Sarvajanik College of Engineering & Technology
Registration:	80
Confirmed Participants:	57 (Only Faculties working with GTU affiliated colleges)
Actual Participation:	55
Certificate Awarded	40

Participation Registration Details

The FDP received good response from all over India from all categories ranging from Professor to Research Scholar from various states. 80 Registrations were recived.

Designation:
80 responses

- Professor
- Associate Professor
- Assistant Professor
- HoD
- Chemical engineer
- Research Scholar
- State Urban Manager(M&E and MIS)
- Student

△ 1/2 ▼

80%
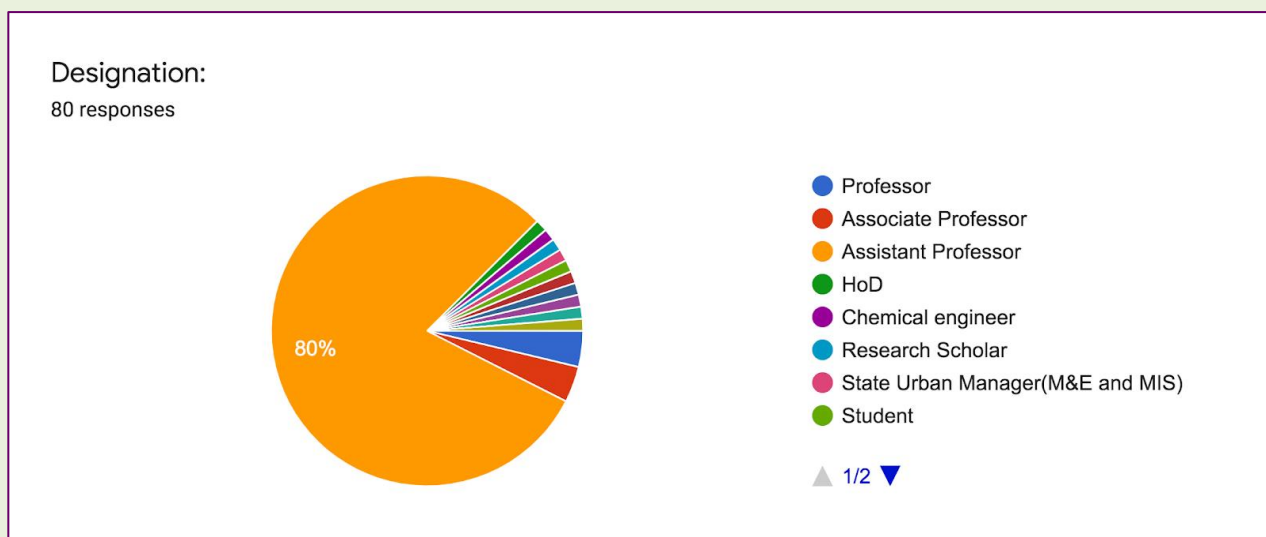
Schedule:

Sr. No.	Title	Time	Name of the Resource Person
Day 1: 1st March 2021 (Monday)			
1	Keynote Address	09:00 AM to 10:30 AM	**Mr. Sunil K. Prasad**
2	Symbolic, Statistical and Neuro-symbolic NLP	10:30 AM to 12:00 PM	**Dr. JatinderKumar Saini**
	Lunch Break	**12:00 PM to 01:00 PM**	
3	Text Pre-processing and its impact on Classification	01:00 PM to 2:30 PM	**Prof. Kaushika Pal**
4	Machine Translation for Indian Languages	02:30 PM to 04:00 PM	**Dr. Vivek Verma**
Day 2: 2nd March 2021 (Tuesday)			
5	Challenges and Solution of Gujarati Grammar Analysis	09:00 AM to 10:30 AM	**Dr. Apurva Desai**
6	Approaches to Automatic Text Summarization	10:30 AM to 12:00 PM	**Dr. Parth Mehta**
	Lunch Break	**12:00 PM to 01:00 PM**	
7	WSD using Semantic Similarity Measure	01:00 PM to 2:30 PM	**Prof. Zankhana Vaishnav**
8	NLP with SpaCy	02:30 PM to 04:00 PM	**Dr. Jignesh Doshi**
Day 3: 3rd March 2021 (Wednesday)			
9	Language Modelling	09:00 AM to 10:30 AM	**Dr. Brijesh Bhatt**
10	Industry applications of Deep Learning and NLP	10:30 AM to 12:00 PM	**Mr. Krishna Mouli**
	Lunch Break	**12:00 PM to 01:00 PM**	
11	Text Classification of Indian Languages	01:00 PM to 2:30 PM	**Dr. Jasleen Kaur**
12	AI Applications post COVID	02:30 PM to 04:00 PM	**Dr. Priti Sajja**
Day 4: 4th March 2021 (Thursday)			
13	CNN with it's Application	09:00 AM to 10:30 AM	**Dr. Mayuri Mehta**
14	Image Super Resolution using Deep Learning	10:30 AM to 12:00 PM	**Dr. Kishor Upla**
	Lunch Break	**12:00 PM to 01:00 PM**	
15	Enhancement of Low Light Dynamic Video for Various Applications	01:00 PM to 2:30 PM	**Mr. Madhav Pandya**
16	Emotional Intelligence for Teachers	02:30 PM to 04:00 PM	**Dr. E. V. Swaminathan**

Sr. No.	Title	Time	Name of the Resource Person
Day 5: 5th March 2021 (Friday)			
17	Real World Applications of Computer Vision	09:00 AM to 10:30 AM	**Dr. Sridhar Srinivasan**
18	Analysis of VNIR Spectral Signatures for estimation of metal and Soil using Deep Learning	10:30 AM to 12:00 PM	**Dr. Snehal Joshi**
	Lunch Break	**12:00 PM to 01:00 PM**	
19	Non-Invasive COVID-19 Detection Techniques	01:00 PM to 2:30 PM	**Dr. Chirag Pauwala**
20	Deep Learning in Search Engine Optimization	02:30 PM to 04:00 PM	**Dr. Biraj V. Patel**
Day 6: 6th March 2021 (Saturday)			
21	Deep Learning on Finance Apps	09:00 AM to 10:30 AM	**Mr. Rakesh Parmar**
22	Machine Reasoning	10:30 AM to 12:00 PM	**Dr. Mansi Patwardhan**
	Lunch Break	**12:00 PM to 01:00 PM**	
23	Issues in Balancing the Performance and Interpretability of Deep Learning based Models	01:00 PM to 2:30 PM	**Mr. Mahesh Panchal**
24	**Feedback and Examination**	02:30 PM to 04:00 PM	

Day 1 : 1st March 2021 (Monday)

The first day of FDP started with keynote address for wide applications of Natural Language Processing and Deep Learning widley use worldwise in industries by Mr. Sunil K. Prasad Chief Digital Transformation and Innovation Architect (Healthcare Digital/Emerging Technologies) Leidos, Washington. The MOC of the day was headed by Prof. Prashant Keswani, Senior Assistant Professor of MCA Department, SCET. Total four sessions were arranged on the day and the details are mentioned in the flyer below:

Session 1	Keynote Address
Content	The Joint AICTE-GTU sponsored FDP on Natural Language Processing and Deep Learning – Trends and Applications started with the keynote address by Mr. Sunil K. Prasad, Chief Digital Transformation and Innovation Architect at Leidos, Washington DC, USA. He discussed about the usage of Artificial Intelligence in various industries including Hospitality, Agriculture, Manufacturing, Retail, Cyber Security, Automobile and many more. He highlighted that by 2050 machines might be lot more intelligent than humans, a thought that might sound scary, but may turn into reality.

Session 2	Symbolic, Statistical and Neuro-symbolic NLP
Content	Dr. Jatinderkumar R. Saini, Professor and Director at Symbiosis Institute of Computer Studies and Research, Pune gave the second session. He discussed Symbolic, Statistical and Neuro-symbolic Natural Language Processing. He summarized the entire history of Natural Language Processing starting from 1970s and 1980s. He explained how the work in the area of Natural Language Processing has evolved from Linguistics to Computational Linguistics to Symbolic to Statistical to Neuro-symbolic. He highlighted the difference between Rationalist and Empiricist approaches. He shared that such sessions on research on needed topics will generate interest and more resources could be negated to solve real world problems.

Session 3	Text Pre-processing and its impact on Text Classification
Content	The third session was given by Prof. Kaushika Pal, Head, MCA Department, SCET. The title of the talk was Text Processing and its impact on Text Classification. She started by introducing Natural Language Processing and its component. She explained Linguistics, computer Liguistics and discussed detailed text preprocssing with practical example. She also covered what is text classification and how it categorizes text with practical example. She explained how text classified into various categories and how the linguistics and Text Pre-processing affects this classification.

Session 4	Machine Translation for Indian Languages
Content	The final session of the day was given by Dr. Vivek Verma, Assistant Professor, Manipal University, Jaipur. He discussed the concept of Machine Translation for Indian Languages. He explained that machine translation is the task of automatically converting one natural language into another preserving the meaning of source language and producing fluent output in the target language. He also discussed about the recent trends in machine translation.

Some glimse of day 1

Day 2 : 2nd March 2021 (Tuesday)

The Second day of FDP started with Grammar Analysis of Gujarati Language by Dr. Apurva Desai. The MOC of the day was headed by Dr. Alpa Shah, Senior Assistant Professor of MCA Department, SCET. The fifth, Sixth, Seventh and Eight sessions was arranged on the day and the details are mentioned in the flyer below:

Session 5	Challenges and Solution of Gujarati Grammar Analysis
Content	Dr Apurva Desai shared his knowledge regarding Morphological Analysis of Gujarati Natural Language. He discussed the syntax and semantics of the language to analyze the structure. He threw light on other works like Offline/online Gujarati Character Optical Character Recognition, Numeral Identifications, text mining, sentiment analysis on Gujarati tweets, and tagging and Grammar Analysis.

Session 6	Approaches to Automatic Text Summarization
Content	Parth Mehta discussed various approaches to Automatic Text Summarization. He shared the industry standard and practices that are used for summarizing webinars and online contents. He threw light on the building blocks of text representation like one-hot encoding and TF-IDF. He discussed about word embedding and text summarization pipeline.

Session 7	WSD using Semantic Similarity Measure
Content	Prof. Zankhana talked about one basic problem that researchers face. She talked about one basic problem called Word Sense Disambiguation that researchers face. She also talked about approaches to WSD and challenges around it. Also she gave information about some libraries that can be used for NLP for Indian languages.

Session 8	NLP with SpaCy
Content	Dr Jignesh talked about how SpaCy is used for tokenization with practical demonstrations. He illustrated how Stop words could be ignored while doing natural language processing. He highlighted about Named Entity Recognition using SpaCy. He also discussed Chatbot applications. He made aware about various facilitates in SpaCy for text processing and also discussed the limitations and solutions to overcome the limitations

Some glimse of day 2
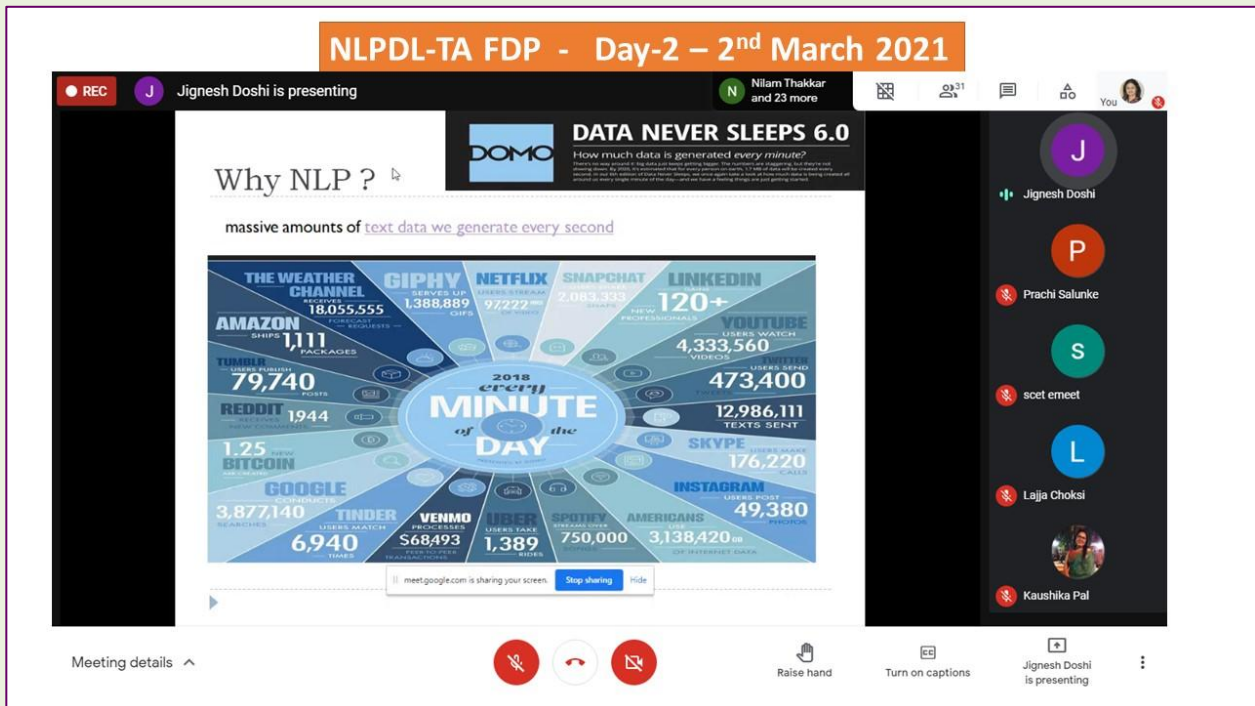
Day 3 : 3rd March 2021 (Wednesday)

The third day of FDP started Language Modelling. The MOC of the day was headed by Prof. Gayatri Kapadia, Senior Assistant Professor of MCA Department, SCET. The ninth, tenth, eleventh and twelfth sessions was arranged on the day and the details are mentioned in the flyer below:

Session 9	Language Modelling
Content	Dr. Brijesh Bhatt Sir delivered his talk on "Language Modeling" and covered the various topics like Grammar Rules: Set of Symbols, Complex Grammar Rules like Morphology, Part of Speech, Dependency etc. He also explained about the ambiguity in symbols' meaning and Applications of language models like machine translation, speech to text conversion etc. Alignment of machine translation, Surrounding words, context of sentence, context of a word, n-gram model, 1-gram model, bi-gram model, RNN based language model.

Session 10	Industry applications of Deep Learning and NLP
Content	Mr. Krishna Mouli Sir talk was on "Industry Applications of Deep Learning and NLP". He shared his experience and knowledge about AI Journey, Deep Learning, and Applications. Before starting NLP related topics he first explained What is NLP and its Applications by demonstrating Use Cases on NLP, AI Concepts, Deep Learning Algorithms, MODERN AI and its examples, Sentiment Analysis and its examples, Core Concepts of NLG, NLG Chat Bots, Boston Use Cases, Tender Search, BOM Builder.

Session 11	Text Classification of Indian Languages
Content	Dr. Jasleen Kaur deliveredtalk on "Text Classification of Indian Languages". She explained Language and Communication, NLP, Components of NLP, Text Classification on Indian Languages. She introduced to Bag of words, Document term Matrix, Vector Space model, etc. necessary to work with Text. She showed use case of Theme based Poetry Classification, Research Challenges in Indian Language NLP, Application of Text Classification. She also enlightened various opportunities for doing research in NLP.

Session 12	AI Applications post COVID
Content	Dr. Priti Sajja gave a talk on "AI Applications Post COVID". She elucidated about 5G of AI and the different domains of AI, problems with traditional AI. She also explained how we can investigate the advantages of Bio-inspired computing for more effective problem solving and how we can apply it on different domains like education. She gave various instances of applications of fuzzy CNN to COVID19 in Healthcare as well as entertainment, media and social media.

Some glimse of day 3
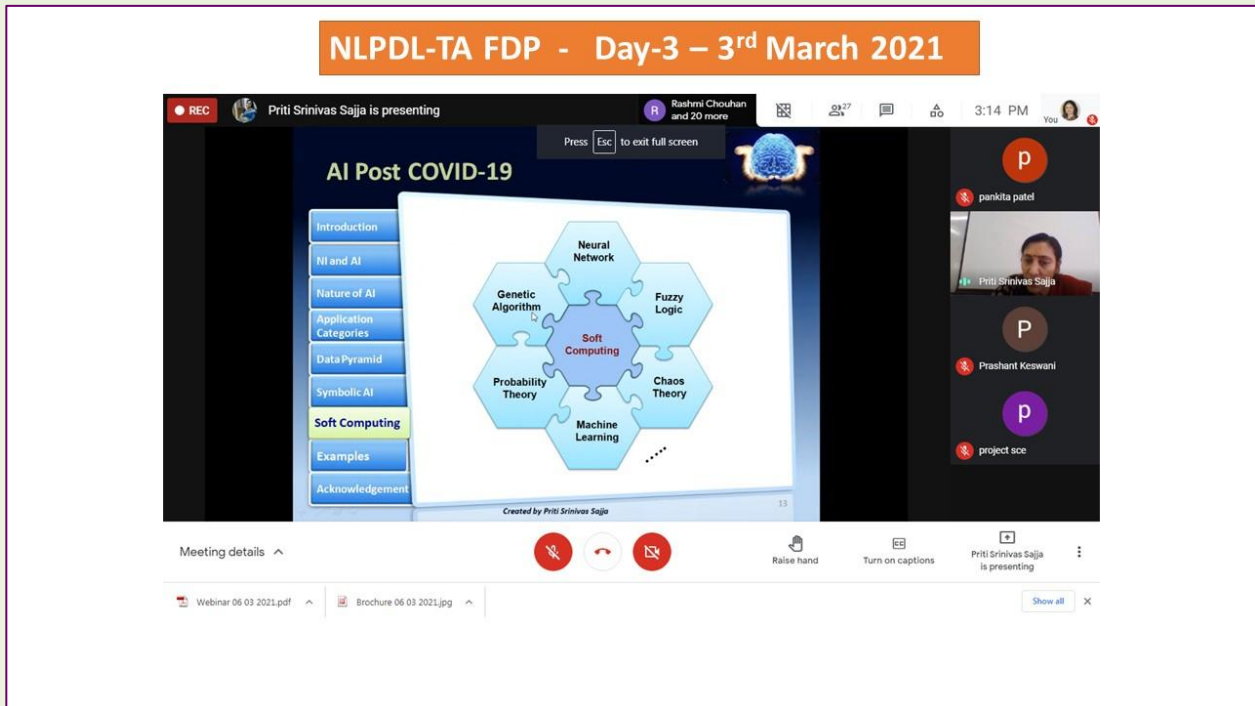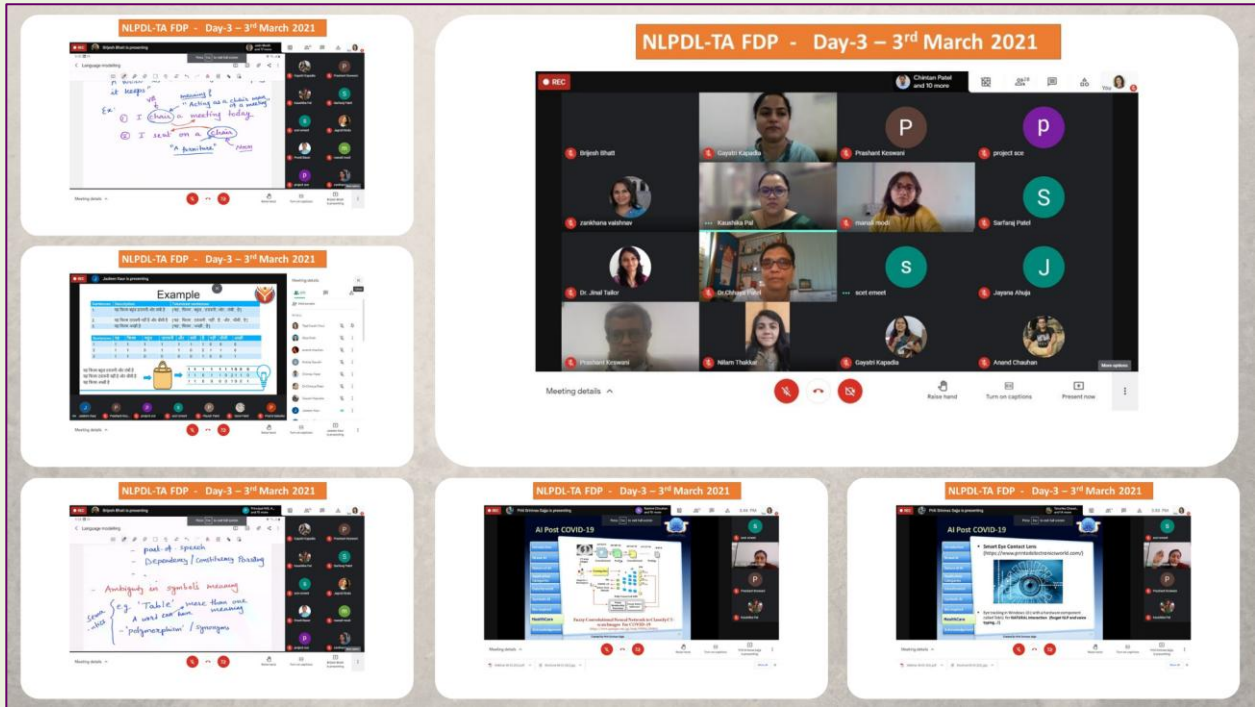
Day 4 : 4th March 2021 (Thursday)

The fourth day of FDP started CNN and its applications. The first and last sessions were swapped due to urgency from speaker. The MOC of the day was headed by Prof. Zankhana Vaishnav, Assistant Professor of MCA Department, SCET. The thirteenth, fourteenth, fifteenth and sixteenth sessions was arranged on the day and the details are mentioned in the flyer below:

Session 13	CNN with it's Applications
Content	The Joint AICTE-GTU sponsored FDP on Natural Language Processing and Deep Learning – Trends and Applications day 4 started with the session from Dr. Mayuri Mehta, Professor, Department of Computer Engineering, SCET, Surat. She discussed about significance of CNN for object classification and recognition problems, architecture of CNN, transfer learning for image and video processing. She also discussed about some Use cases of CNN based applications. The session was very engaging and informative.

Session 14	Image Super Resolution using Deep Learning
Content	Dr. Kishor Upla, Assistant Professor, Electronics Engineering Department, S. V. National Institute of Technology, Surat, gave the second session. In the session he discussed the topic - Face recognition. He also gave information about Image Super-Resolution, training details, and parameter settings of proposed method. He also gave future direction about the domain. The session was very dynamic and informative.

Session 15	Enhancement of Low Light Dynamic Video for Various Applications
Content	The enchanting third session was taken by Innovator Madhav Pandya, Researcher in the areas of Internet of Things (IoT), Deep Learning, and Robotics. His session was on Enhancement of low-light dynamic videos. He presented the dark raw dataset, preprocessing of low light videos, ResUnet architecture, applications and implementation details. The session was very new and capturing.

Session 16	Emotional Intelligence for Teachers
Content	The last and very unusual session was on "Emotional Intelligence for Teachers" by Dr. E. V. Swaminathan, a Trainer, Teacher, Counselor and Consultant with a clear focus on creating a Value Based Society. Dr. Swaminathan enlightened the participant about the importance of Emotional Intelligence (EQ) in one's life and how it can be achieved. What are the strength of the mind and how it matters the most in life. He added that the need to add Emotional Quotient in every individual and Student is crucial. The session was life changing and path defining.

Some glimse of day 4

NLPDL-TA FDP - Day-4 – 4th March 2021
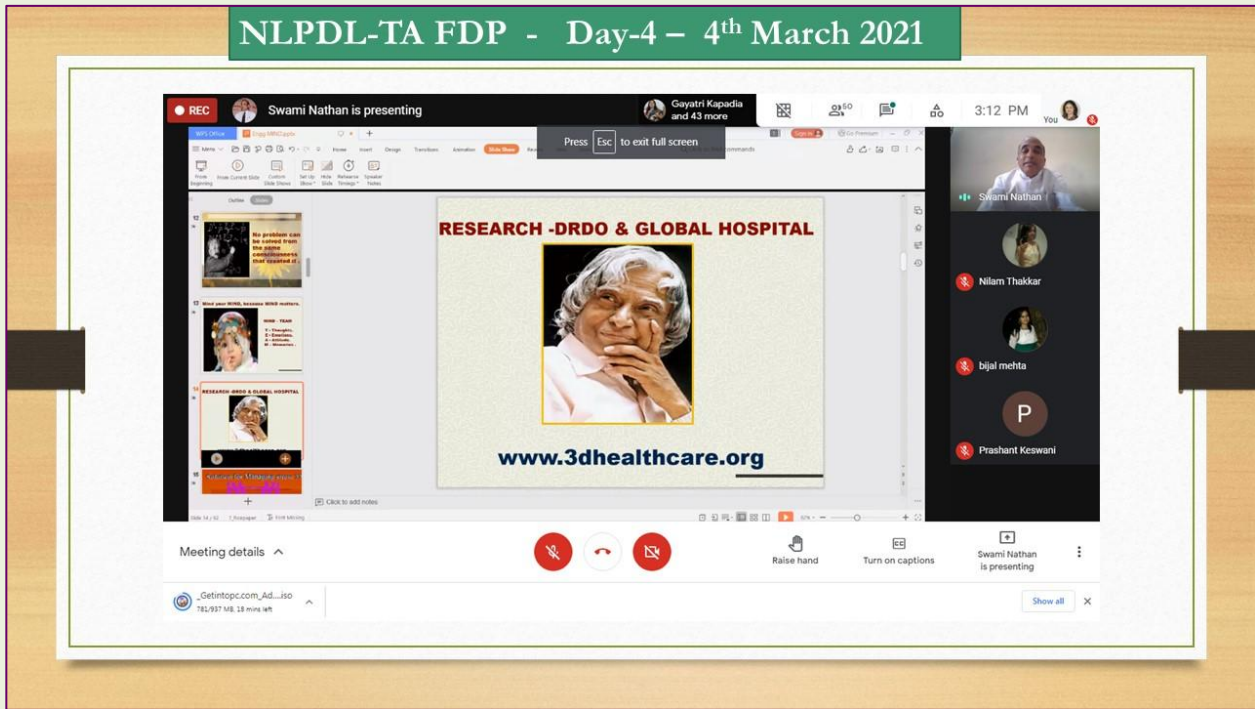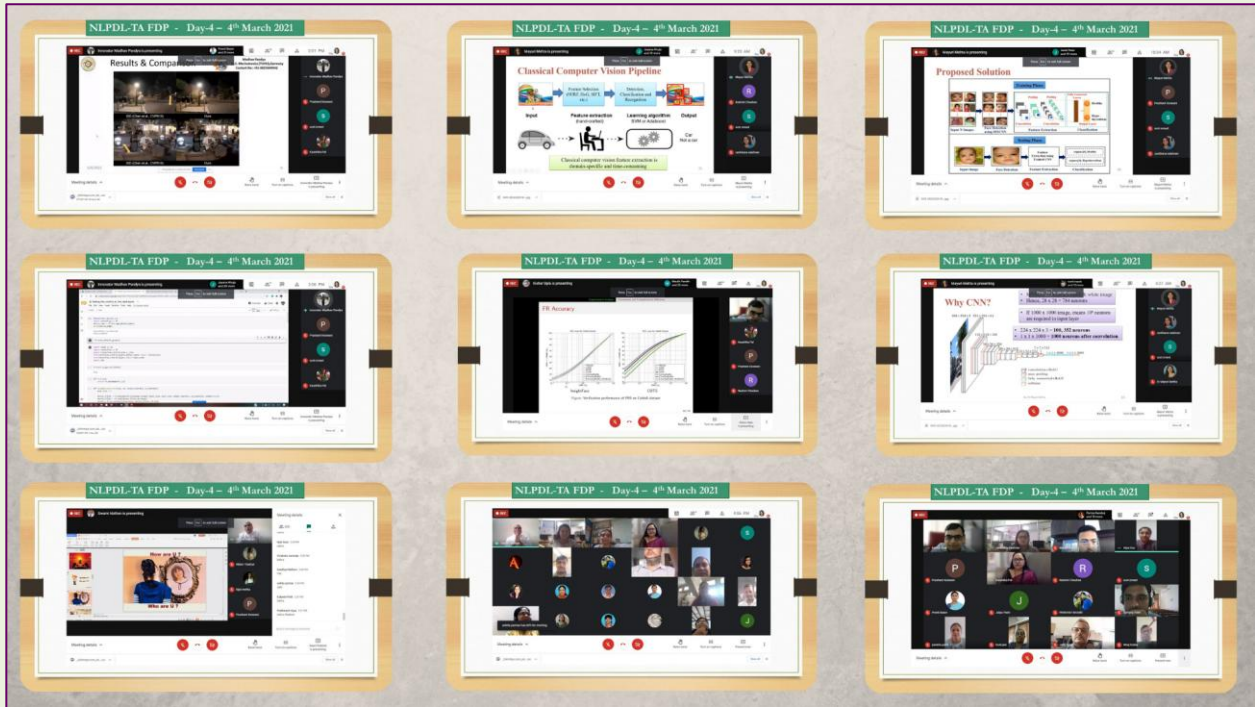
Day 5 : 5th March 2021 (Friday)

The fifth day of FDP started with real world applications of Computer Vision. The MOC of the day was headed by Prof. Jayana Ahuja, Assistant Professor of MCA Department, SCET. The seventeenth, eighteenth, nineteenth and twentieth sessions was arranged on the day and the details are mentioned below:

Session 17	Real World Applications of Computer Vision
Content	Dr.Sridhar Srinivasan gave the first session of day 4. He discussed the topic Real World Applications of Computer Vision**.** In which he discussed many applications related to Agriculture, Health, Medical any many more .He also gave information about how Image processing help in different areas of Real world application. The session was very informative with some of the currently working projects.

Session 18	Analysis of VNIR Spectral Signatures for estimation of metal and Soil using Deep Learning
Content	Dr. Snehal Joshi gave this session. In the session he discussed the topic - Analysis of VNIR Spectral Signatures for estimation of metal and Soil using Deep Learning. He also share his knowledge on Visible near-infrared (VNIR) spectra can provide rich information on soil physical and chemical properties, which implies the possibility of using soil spectra to aid in the discrimination of soil types. The session was very informative to audience.

Session 19	Non-Invasive COVID-19 Detection Techniques
Content	Dr. Chirag Pauwala conducted the session and he discussed the topic Non-Invasive COVID- 19 Detection Techniques. He started session with what are the COVID 19 Diagnosis Methods available. He explains the degradation method and also discussed about image processing based approach in Tonsillitis. He also discussed about how image based detection methods used in check COVID-19 affected patient. He also explained the impact of class imbalance.

Session 20	Deep Learning in Search Engine Optimization
Content	Dr. Biraj V. Patel gave the last session of day 4. In the session he discussed the topic Deep Learning in Search Engine Optimization. He has started his session with types of learning. He gave difference between Deep Learning & Machine Learning. He also discussed about how Data Analytics work and what types of optimization techniques we should apply to get the first rank on Search Engine. The session was very dynamic and informative.

Some glimse of day 5
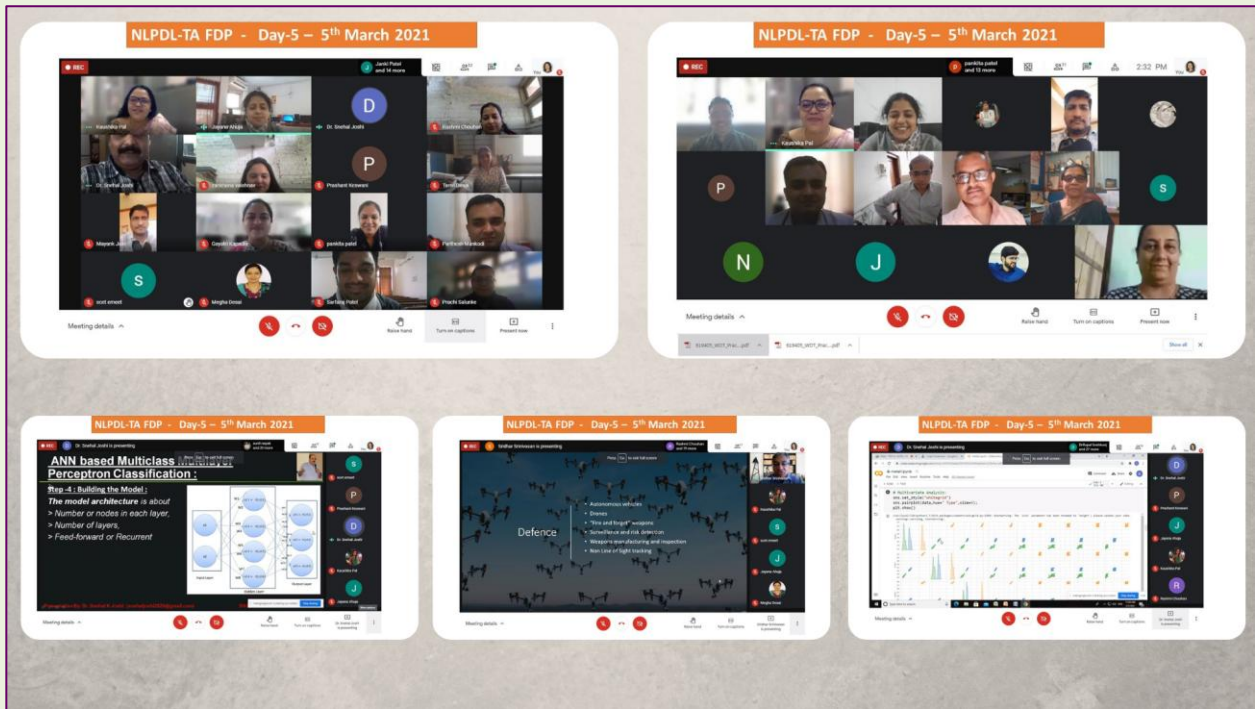
Day 6 : 6th March 2021 (Saturday)

The Sixth and the last day of FDP started Deep learning applications in Financial Apps, by Mr. Rakesh Parmar, Vice President, Morgan Stanley,USA . The MOC of the day was headed by Prof. Rashmi Chouhan, Assistant Professor of MCA Department, SCET. The 21st , 22nd, and 23rd sessions was arranged on the day and the details are mentioned in flyer below. The Examination was taken to check understanding of participants of the FDP Conducted.

Session 21	Deep Learning on Finance Apps
Content	Mr. Rakesh Parmar highlighted on why and where we can use Deep Learning in Financial Apps? He gave an insight about that Deep Learning is helpful in Creating Investors profile or Investors Proposal for investment, How to know about Risk Profile? How better ROI can be created for investors? He also talked about sentiment analysis that can help the Financial Advisor to guide his/her Investors.

Session 22	Machine Reasoning
Content	Dr. Manasi Patwardhan started discussion with difference between Machine Reasoning and Machine Learning. She also discussed about inference rules and External Knowledge needs to be applied to Machine. She also gave information about Neural Network and its usage in Advertisement or pattern recognition. She explained pattern recognition with the example of Regression. She explained how common sense could be added to factual data like images using machine reasoning. She also gave us awareness regarding AI and Deep Learning Ethics.

Session 23	Issues in Balancing the Performance and Interpretability of Deep Learning based Models
Content	Prof. Mahesh Panchal discussed about Explainable AI and Responsive AI. He also explained about the Trade Off between Accuracy and Interpretability. He highlighted on stakeholders of AI and Explainable system. He explained about categorization of Interpretable ML Models. He also explained about Global Surrogate Models. He has described about LIME (Local Interpretable Model Agnostic Explanation).

Feedback and Examination	
Content	From 2:30 PM onwards examination was conducted with MCQ Questions. Participants' feedback was taken along with suggestions to improvise such program in future.

Some glimse of day 6
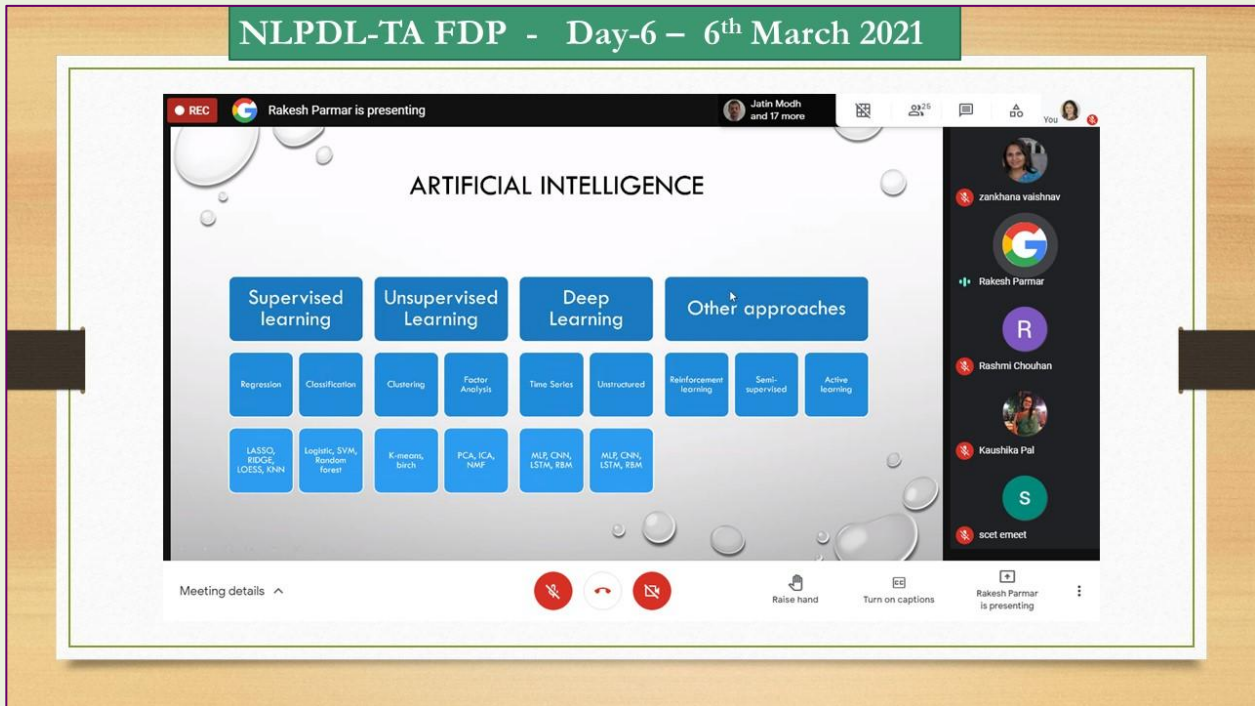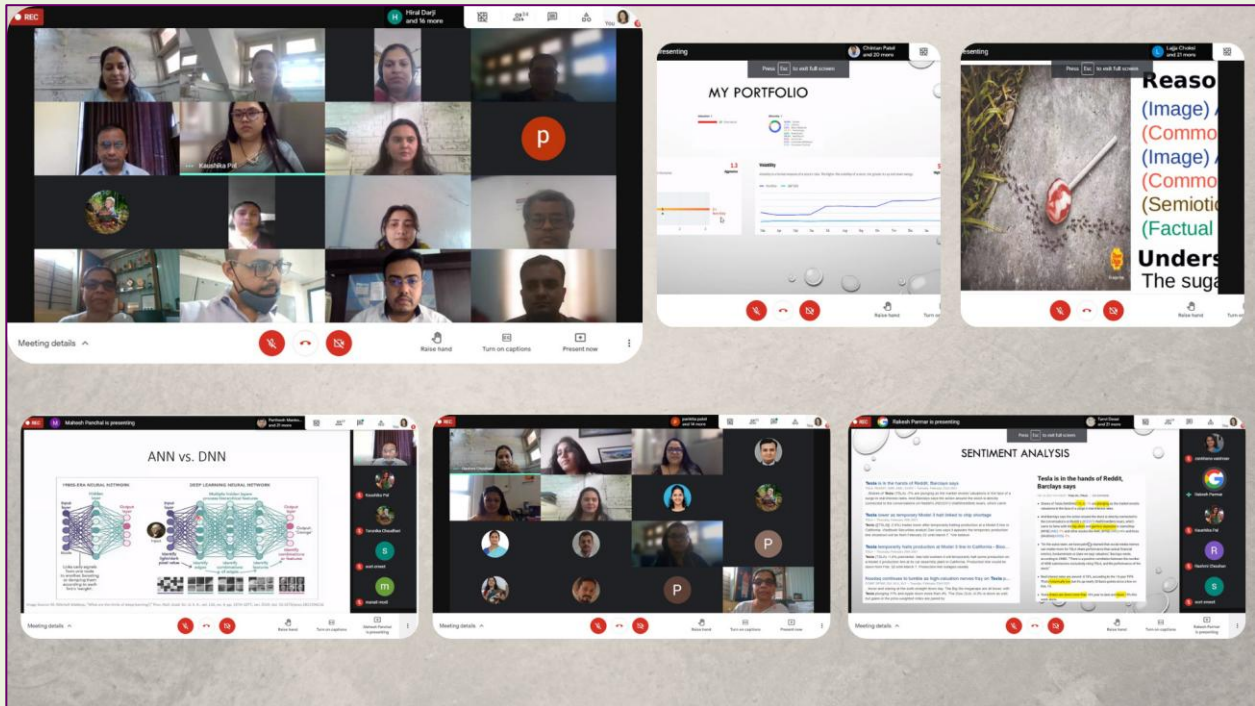
Outcomes of FDP :

1. Enhanced the knowledge in the domain of Natural Language Processing and Deep Learning
2. Enriched the participants with the recent trends and industry applications in Natural Language Processing and Deep Learning
3. Threw light in the research for Natural Language Processing in native languages like Gujarati, Hindi, etc.
4. Demonstrated practically text processing, text classification and use of native libraries like SpaCy. NLTK, Sklearn, etc.
5. Exemplified research done for COVID-19.
6. Introducing Common sense to factual data with machine reasoning
7. Research directions to faculties in the field of AI components Natural Language Processing and Deep Learning.
8. Validated context of the word using Semantic Similarity Measure.

Feedback of the Workshop

The feedback received was satisfactory, some comments given by participants are pasted below:

Any other suggestion/comment which you would like to give us for improvement

11 responses

Very good workshop more practical experience can be included like Dr. Manasi

Really knowlege sharing FDP

NA

Really informative FDP. Looking forward for such Technical Talks.

It was very well coordinated STTP, I got to learn a lot from it thank you everyone involved for giving us such an useful learning

Very good

Please share recorded session for future reference

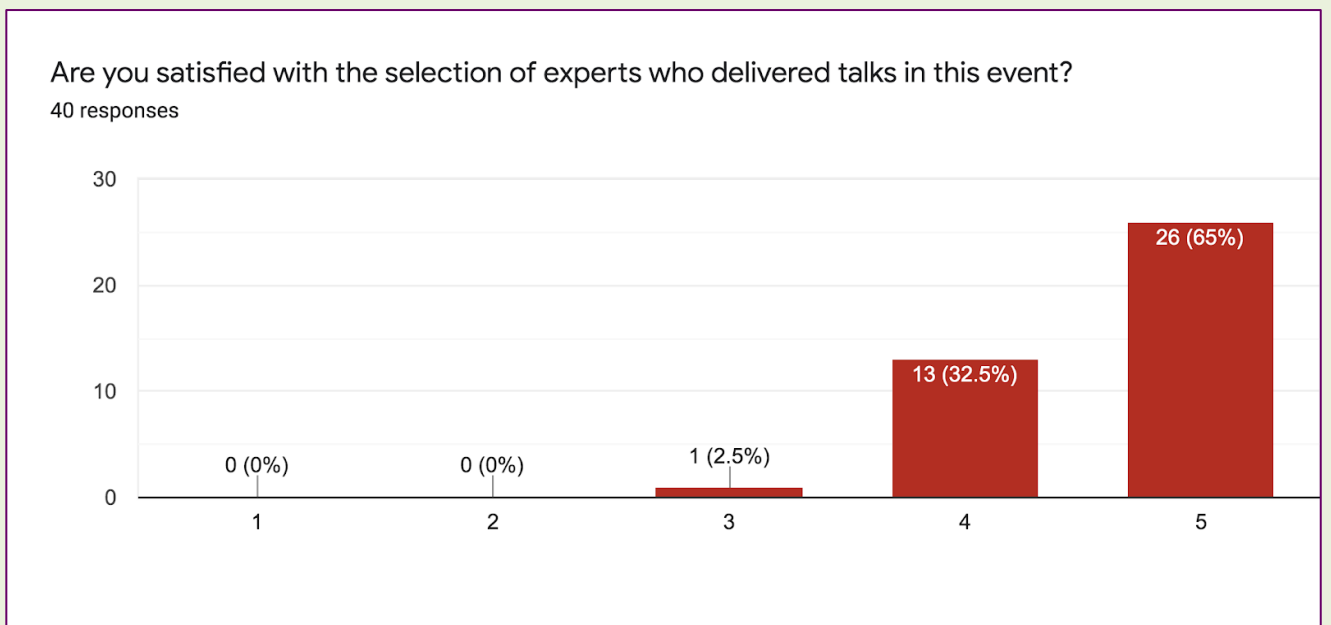IT WAS VERY INFORMATIVE, I SUGGEST THAT IT SHOULD BE OF MULTIPLE TECHNOLOGY

Great speakers enhanced the spectrum of NLP and made us rich with the real time applications of the theme

All FDP session was valuable and help me increase in my knowledge. Thanks for organizing such knowledgeable FDP.

Approximatly 97.5% Participants agreed that the FDP enhanced knowledge in them. The pie chart to shown below is the feedback recived from the participants.

Have this FDP enhanced your knowledge
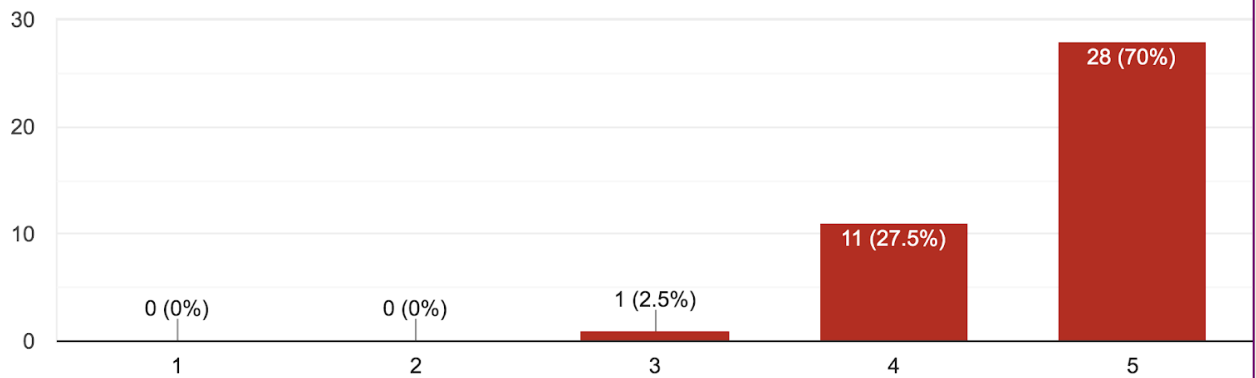40 responses

- YES
- NO
- Somewhat

97.5%
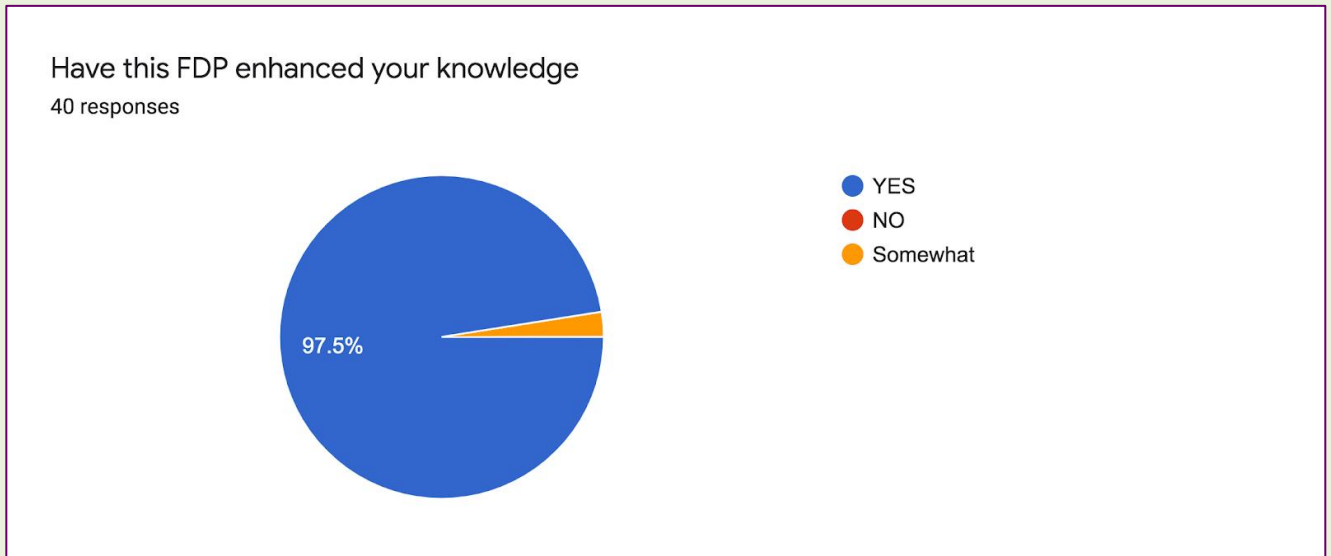
Participants were also satisfied with the selection of experts for the FDP, interacting with them. Their view is shown in report in form of bar chart.
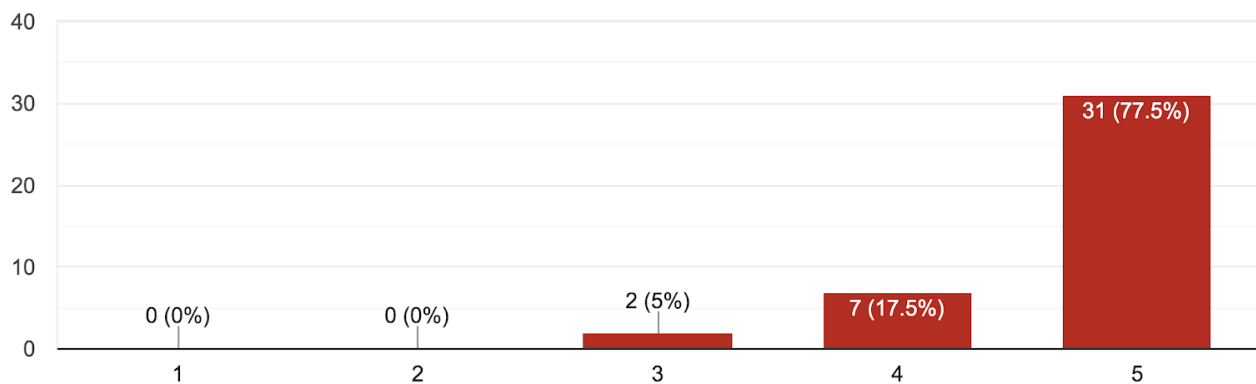
Are you satisfied with the selection of experts who delivered talks in this event?
40 responses

0 (0%)	0 (0%)	1 (2.5%)	13 (32.5%)	26 (65%)
1	2	3	4	5

How much are you satisfied with the networking and interaction opportunity with the experts?

40 responses

Please give overall rating to this FDP.

40 responses

The response for FDP by the participants and the feedback of the sessions and speakers was very good.

Acknowledgement

We the MCA, SCET want to thank **GTU and AICTE** for supporting the FDP and permitting SCET to organized the FDP for the benefit of teaching community, which is an indirect help to the students of Computer Science who wants to perceive their career in NLP and Deep Learning.

We would also like to thank **Dr. Hiren Patel**, Principal, SCET, for providing an opportunity to apply, and Dr. Chirag Pauwala, Dean R & D, SCET to provide guidance wherever needed.

We also thank Coordinator from GTU Dr. Sarika Shrivastav for her straight and clear reply for queries posted to her.

"IF YOU ARE PLANNING FOR A YEAR, SOW RICE; IF YOU ARE PLANNING FOR A DECADE, PLANT TREES; IF YOU ARE PLANNING FOR A LIFETIME, EDUCATE PEOPLE"

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Report compiled by Prof. Kaushika Pal (FDP Convener & Coordinator)