

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

L B Reddy Nagar, Mylavaram, Krishna District, Andhra Pradesh-521230

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Department of Information Technology

REPORT

on

AICTE Training & Learning (ATAL) Sponsored

Faculty Development Program (FDP) on

"BIO-INSPIRED COMPUTING FOR DATA

ANALYTICS"

(08th Feb. 2022 to 12th Feb. 2022)



Department of Information Technology (IT), Lakireddy Bali Reddy College of Engineering (Autonomous) has organized AICTE Training & Learning (ATAL) Sponsored Faculty Development Program (FDP) on "BIO-INSPIRED COMPUTING FOR DATA ANALYTICS" during 08th Feb. 2022 to 12th Feb. 2022. This FDP received an overwhelming response with 200 participants from different AICTE recognized institutes were registered across various states of India.

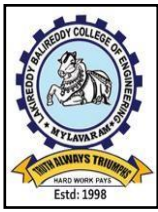
Day 1: 08th Feb. 2022

Inaugural Program:

Inaugural session of Faculty Development Program was started at 9:30 AM on 08th February 2022 by **Dr E. Damodar Reddy**, Associate Professor, Dept. of CSE, NIT-Goa, **Dr. K. Appa Rao**, Principal, LBRCE (A), **Dr. M. Srinivasa Rao**, Dept of CSE, Professor and Dean of Academics, **Dr. E. V. Krishna Rao**, Dept of ECE, Professor and Dean R&D, , **Dr. K. Lavanya**, Coordinator of this FDP, Associate Professor, **Dr. B. Srinivasa Rao**, Convenor, HoD, Dept. of IT, and the Co-Coordinators, **Dr. K. Anupriya**, and **Dr. B. Rama Devi**

Mrs. A. Sarvani has welcomed all the dignitaries and delegates. She was started event as per the program schedule of inaugural session. The reading about the profiles of chief guest **Dr E. Damodar Reddy** by **Dr. K. Anupriya**.

The Program Coordinator Dr. K. Lavanya has extended warm welcome to all the dignitaries and participants. Further, he has emphasized the need for and importance of **BIO-INSPIRED COMPUTING FOR DATA ANALYTICS** aspects in carrying out data analysis in an



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optimized way. In her welcome speech, she highlighted the objectives and outcomes of organizing this faculty development programme. Also provided the details of all the resource persons along with complete Five day schedule and necessary information that is required like Attendance, Feedback, and Assessment Test for completing successfully of this FDP.

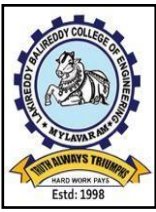
Dr. B. Srinivasa Rao, Convenor, HoD expressed that IT dept is organising this FDP, all the resource persons will energise all the participants through this event, and it will be very useful to the entire faculty to enhance their skills. He thanked AICTE and all the organisers.

Dr. E. V. Krishna Rao, Dean of R&D, expressed warm welcome to chief guest . In his speech, provided the importance of knowledge in the optimization algorithms by every researcher, students to complete projects and publish papers in the reputed journals. Also told this is very upcoming thrust area use this opportunity by every participant.

Dr. M. Srinivasa Rao, Dean Academics, has thanked AICTE and ATAL Academy for giving this opportunity to our college to conduct FDP on Bio-inspired computing for data analytics. Then he congratulates convenor and coordinators for organizing this FDP. In his speech, he added that now a days people are working with massive data even in our academics also every day massive data is generated. There is a necessity of processing and optimizing such kind of data. The use of bio-inspired computing algorithms survives the purpose of processing massive data. The Biological computing is the emerging area in the present days. Also, recommended to the faculty to do Ph.D. in this bio computing or data science.

Dr. K. Appa Rao, Principal, welcome chief guest, faculty, and other participants. In his speech, thanked AICTE for sponsoring this FDP and expressed his wishes all the participants to enhance their skill set and to transform the same knowledge to the students to do their projects etc. He also informed that in teaching profession we need to update our knowledge or skills continuously. Also mentioned that we should get aware about latest emerging areas. He also congratulates coordinator for choosing right topic. Also, thanked to our chief guest **Dr. E. Damodar Reddy** for accepting the invitation to attend program.

The Chief Guest Dr. E. Damodar Reddy, Associate Professor, Dept. of CSE, NIT-Goa. expressed that Bio-inspired computing is emerging area to process any kind of data in an optimized way. In his speech, told the importance of updation of skills by faculty, research scholars and students in research area. Sir said that there is a need of work on real time



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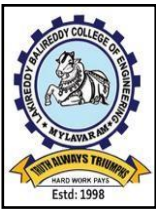
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applications then only quality of work or research will be published. Sir, congratulate organization and FDP committee for choosing the latest Bio-inspired computing and data science topics. At end sir suggested to attend all FDP programs organized by ATAL with association of reputed institute to upgrade skills.

Finally, Mrs **A. Sarvani** has given vote of thanks for all the dignitaries, delegates, management and AICTE.

Fig. 1: Inaugural Speech by Dr. E. Damodar Reddy, Associate Professor, Dept. of CSE, NIT-Goa, Dr. K. Appa Rao, Principal, LBRCE (A), Dr. E.V. Krishna Rao, Dean R&D, Dr. M. Srinivasa Rao, Dean of Academics, Dr. B. Srinivasa Rao, Convener, HoD, Dept. of IT.



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Fig. 2: Press coverage by Dr. K. Harinadha Reddy, Vice-principal, LBRCE(A), Dr. E.V. Krishna Rao, Dean R&D, Dr. M. Srinivasa Rao, Dean of Academics, Dr. B. Srinivasa Rao, Convenor, HoD, Dept. of IT, Dr.K.Lavanya, coordinator of FDP, Dr.B.Rama Devi, co-coordinator of FDP .

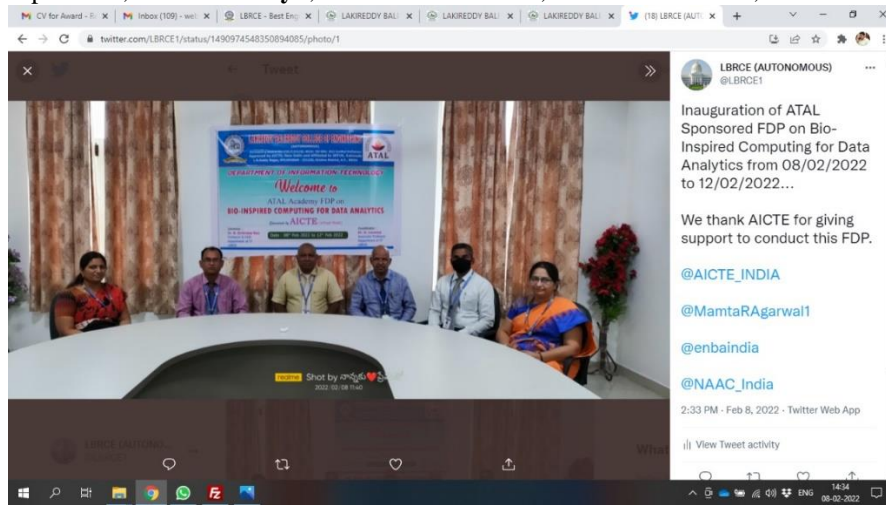


Fig. 3: Twitter Posting: Inauguration of FDP

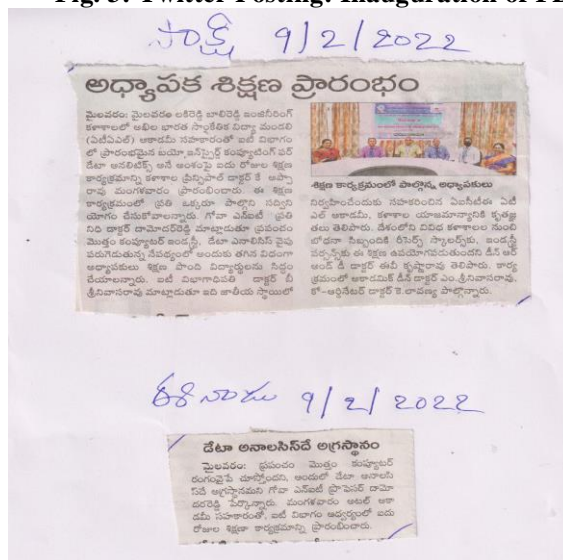
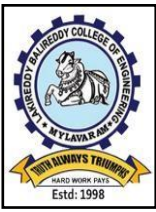


Fig. 4: Paper Clipping on local papers: Inauguration of FDP

ATAL FDP on "BIO-INSPIRED COMPUTING FOR DATA ANALYTICS" 08th Feb. 2022 to 12th Feb. 2022 Organized by Department of IT, LBRCE (A), Mylavaram



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Day 1: 08/02/2022 (Sessions: 01 to 03)

Session: 01

Topics: Swarm Intelligence: Challenges and Applications

Resource Person: Dr. E. Damodar Reddy, Associate Professor, Dept. of CSE, NIT-Goa

Dr. E. Damodar Reddy has presented the importance of swarm intelligence for solving the problems using the techniques like Particle Swarm Optimization (PSO), Ant Colony Optimization (ACO) and genetic algorithms. Provided the Search techniques, given clear difference about the deterministic and stochastic search techniques. He has given deep insights about components of search techniques with examples. Further, he explained detailly about PSO and ACO with real time examples.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-1 (08-02-2022): Session-1

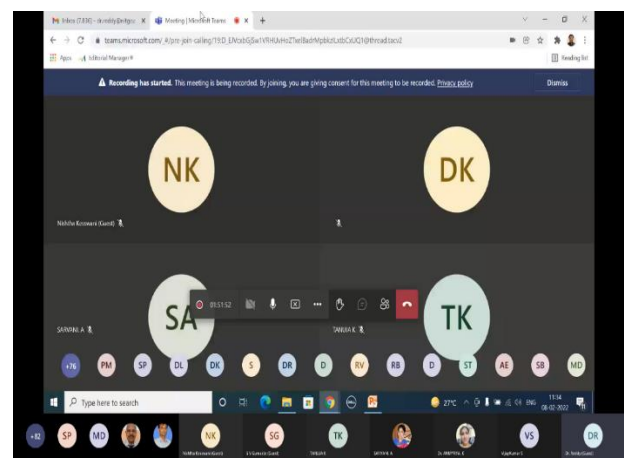
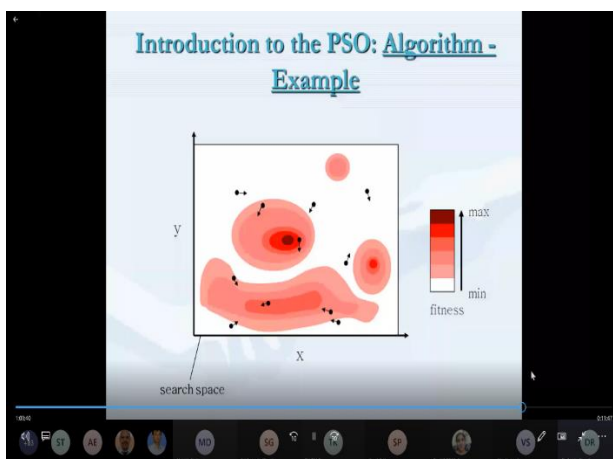
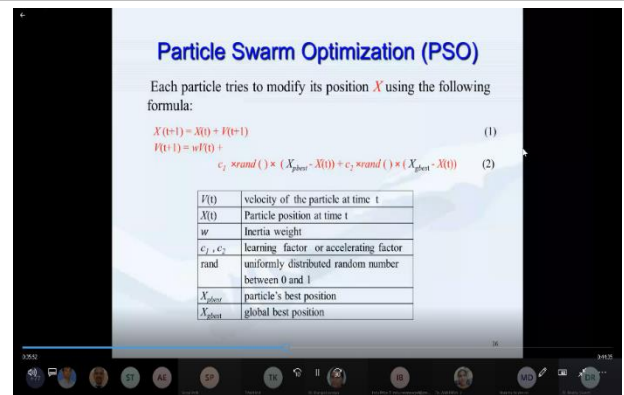
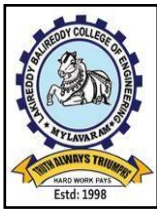


Fig. 5 : 08/02/2022 – Session 01 by Dr. E. Damodar Reddy on Swarm Intelligence: Challenges and Applications



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Session: 02

Topics: Classification Rule Mining using Bio-inspired algorithms: Diabetes Data

Resource Person: Dr. Cherukuri Ramalinga Swamy, Assistant Professor, Dept. of CSE, NIT-Warangal

Dr. Cherukuri Ramalinga Swamy has delivered a talk on how diabetes data is going to classify using rule mining. He also discussed about how to optimize the classification using Bio-inspired algorithm using ACO, PSO, ABC and SM Rule maker. Further, he addressed the diabetes data classification with hands on session using python.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-1(08-02-2022): Session-2

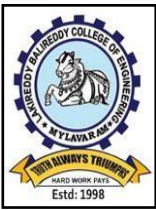
Table: Performance comparison of various meta-heuristic-based classification rule mining algorithms and the proposed rule miner using 10-fold cross validation.

Type of meta heuristic approach used for rule mining	Accuracy (%)	Sensitivity (%)	Specificity (%)	Author (Year) [Refs.]
ACO	84.24	84.13	85.86	M. F. Ganji et al. (2011) [26]
Modified ABC with all features	82.68	81.91	83.07	F. Beloufa (2013) [27]
Modified ABC with feature selection	84.21	83.45	84.60	F. Beloufa (2013) [27]
ABC with all features	79.61	78.54	80.18	F. Beloufa (2013) [27]
ABC with feature selection	81.40	80.76	82.88	F. Beloufa (2013) [27]
PSO	82.32	84.60	80.76	M. E. H. Daho (2013) [26]
Proposed SM-RuleMiner	89.87	94.60	80.11	This study

Conclusion: P... performance

Fig. 6 : 08/02/2022 – Session 02 by Dr. Dr. Cherukuri Ramalinga Swamy on Classification Rule Mining using Bio-inspired algorithms : Diabetes Data

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Session: 03

Topics: Applications of Swarm Intelligence Techniques in Wireless Sensor Networks

Resource Person: Dr. Trilochan Panigrahi, Associate Professor, Dept. of ECE, NIT-Goa

Dr. Trilochan Panigrahi has delivered a talk on how swarm intelligence techniques is going to applied in Wireless Sensor Networks (WSN). He also discussed about various applications where WSN used swarm intelligence for Incremental and diffusion cooperation. Sir, also discussed about the Distributed estimation of IIR systems parameters using diffusion PSO Further, he addressed the Source localization using Swarm Intelligence algorithms with research studies.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-1(08-02-2022): Session-3

Example	Wopt	Mean estimated weight					
		Non-coop LMS	HLMS	DLMS	DPSO 1	DPSO 2	
I	b0	0.05	-0.2381	-0.2475	-0.1942	0.051	0.0504
	b1	-0.4	-0.4036	-0.2840	-0.4035	-0.3029	-0.4007
	a1	1.1314	0.4425	0.3942	0.5507	1.1247	1.1306
II	b0	-0.2	-0.3115	-0.3521	-0.378	-0.2004	-0.2011
	b1	-0.4	-0.0876	-0.1424	-0.2236	-0.4066	-0.3993
	a1	0.6	0.3709	0.4331	0.5002	0.4977	0.4979
III	b0	1	0.1282	0.1255	0.2541	0.5915	0.5979
	b1	-0.9	-0.4002	-0.2427	-0.6503	-0.9119	-0.9157
	a1	0.81	0.5033	0.4291	0.6306	0.8209	0.8121

Fig. 7 : 08/02/2022 – Session 03 by Dr. Trilochan Panigrahi on Applications of Swarm Intelligence Techniques in Wireless Sensor Networks algorithms : Diabetes Data

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Day 2: 09/02/2022 (Sessions: 01 to 03)

Session: 01

Topics: Human Computer Interface using Machine Learning

Resource Person: Dr. E. Damodar Reddy, Associate Professor, Dept. of CSE, NIT-Goa

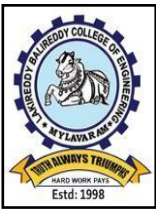
Dr. E. Damodar Reddy has presented the importance of data acquisition using Human computer interface using machine learning. Generally, the people are mainly focused about the analysis and processing, but we need mainly concentrate on how to acquire data from the target object. Sir, also discussed about medical application where the data acquisition how it takes place. Some of the example studies covered in his talk includes Neuro Rehabilitation and Postheses. At end he also discussed about the HCI architecture for data acquisition.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-2 (09-02-2022): Session-1

The figure consists of four screenshots from a presentation. The top-left screenshot is a title slide for an ATAL FDP on 'BIO-INSPIRED COMPUTING FOR DATA ANALYTICS' presented by Dr. E. Damodar Reddy, Associate Professor at NIT-Goa. The top-right screenshot shows a slide titled 'Human Computer Interaction using Machine Learning' by Damodar Reddy Edia, Department of Computer Science and Engineering at NIT-Goa. The bottom-left screenshot is titled 'Neural Prostheses and Neural Rehabilitation' and includes a photograph of a person using a prosthetic leg, with text explaining its use in conjunction with a training program. The bottom-right screenshot is a complex block diagram of a BCI system architecture, showing the interaction between a User (with Electrodes), BCI Control, Feature Extractor, Feature Translator, Control Interface, Device Controller, and a Device in an Operating Environment, with various feedback loops like User Reported Error Feedback, User State Feedback, Device State Feedback, and Device Controller State Feedback.

Fig. 8 : 09/02/2022 – Session 01 by Dr. E. Damodar Reddy on Human Computer Interface using Machine Learning

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Session: 02

Topics: Research scope for Bio-inspired algorithms

Resource Person: Dr. E. Damodar Reddy, Associate Professor, Dept. of CSE, NIT-Goa

Dr. E. Damodar Reddy has presented the importance of doing research in this area by upcoming days. Sir, discussed about the Brain-Computer Interfaces for Communication in Paralysis: A Clinical Experimental Approach. Also, he discussed about his experience with collecting human brain data by various hardware devices in their organization. In his talk, explored more his research experience.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-2 (09-02-2022): Session-2

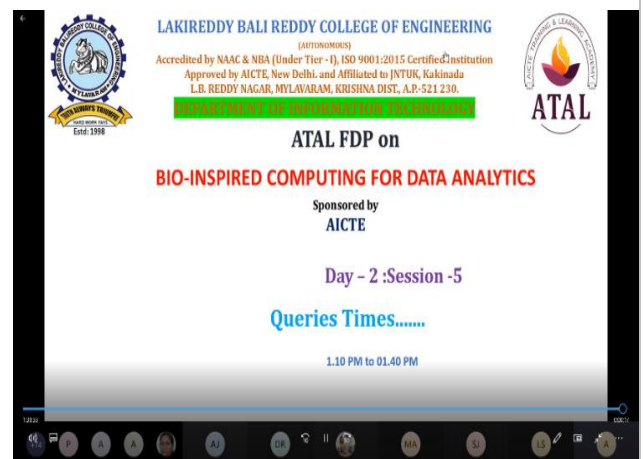
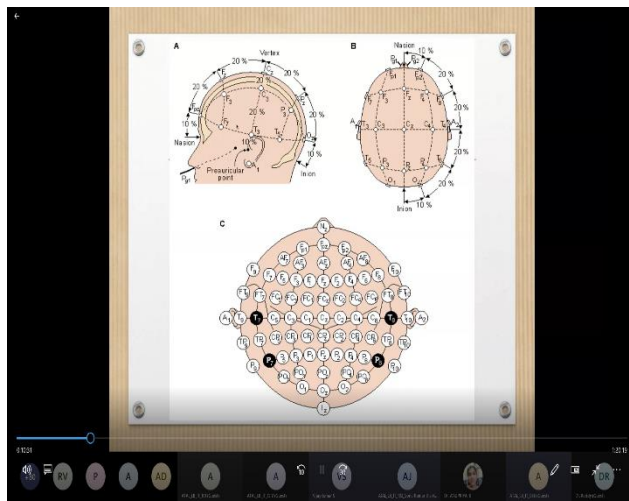


Fig. 9 : 09/02/2022 – Session 02 by Dr. E. Damodar Reddy on Research scope for Bio-inspired algorithms



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Session: 03

Topics: Artificial Bee Colony (ABC) Optimization

Resource Person: Dr. Venkatesh Pandiri, Assistant Professor, Dept. of CSE, IITDM-Kancheepuram.

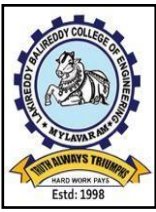
Dr. Venkatesh Pandiri, has presented the talk on Artificial Bee Colony (ABC) optimization in research point of view. In his lecture, covered the concepts of combinatorial optimization problem and GCTSP. He also provided the informative about how to apply ABC for the GCTSP. Provided the computational analysis of the research study. At end, he also provided the information about JRF and Ph.D. calls in their institutes.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-2 (09-02-2022): Session-3

The figure consists of four screenshots from a Zoom meeting. The top-left screenshot is a title slide for the 'ATAL FDP on BIO-INSPIRED COMPUTING FOR DATA ANALYTICS' session, presented by Dr. Venkatesh Pandiri, Assistant Professor, Department of CSE, IITDM Kancheepuram. The top-right screenshot shows the meeting outline, which includes topics such as ABC, Combinatorial optimization problem, GCTSP, ABC for GCTSP, Conclusion and Future work, and References. The bottom-left screenshot displays a software interface for 'Optimization Test Problems', featuring a 3D surface plot of the 'RASTRIGIN FUNCTION' and its mathematical formula: $f(x) = 10d + \sum_{i=1}^d [x_i^2 - 10 \cos(2\pi x_i)]$. The bottom-right screenshot shows a slide titled 'Queries Times.....' indicating the time 03:40 PM to 04:10 PM.

Fig. 10: 09/02/2022 – Session 03 by Dr. Venkatesh Pandiri on Artificial Bee Colony (ABC) Optimization

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Day 3: 10/02/2022 (Sessions: 01 to 03)

Session: 01

Topics: Classification using Bio-Inspired Algorithms

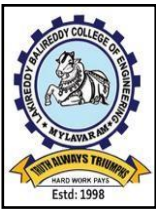
Resource Person: Dr. Lavika Goel Malaviya, Assistant Professor, Dept. of CSE, MNIT, Jaipur.

Dr. Lavika Goel Malaviya has presented talk on the classification techniques using Bio-Inspired Algorithms. In her, talk Provided the detailed information about the taxonomy of computational intelligence. Also, presented how application of Geo-sciences used Bio-Inspired Algorithms for classification problems. At, end discussed about Biogeography and Plate Tectonics based Optimization for Water Body Extraction in Satellite Images as a research study.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-3 (10-02-2022): Session-1

The figure illustrates a Zoom meeting session. The top-left window shows a PowerPoint slide titled "Bio-Inspired Computing and Hybrid approaches for Classification" by Dr. Lavika Goel, Assistant Professor at MNIT Jaipur. The top-right window displays a "Plate-Tectonic Theory" map of the world, highlighting the Indian Plate and other major tectonic plates. The bottom-left window shows a video feed of Dr. Lavika Goel Malaviya. The bottom-right window shows a "Satellite, 3-D View & Classification of Alwar Image" with a 3D terrain model and a classification legend for "Biogeography - Based Optimization Classification of Land cover".

Fig. 11: 10/02/2022 – Session 01 by Dr. Lavika Goel Malaviya on Classification using Bio-Inspired Algorithms



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Session: 02

Topics: SALP swarm algorithm (SSA)

Resource Person: Dr. Dharavath Ramesh, Associate Professor, Dept. of CSE, IIT-Dhanbad

Dr. Dharavath Ramesh has given lecture talk on the SALP swarm optimization. In his talk covered the concepts which includes importance of optimization technique, Genetic Algorithm, Salp swarm optimization algorithm, Memetic salp swarm optimization algorithm. At end, he presented research study on the Application of MSSA for feature selection in crop disease classification.

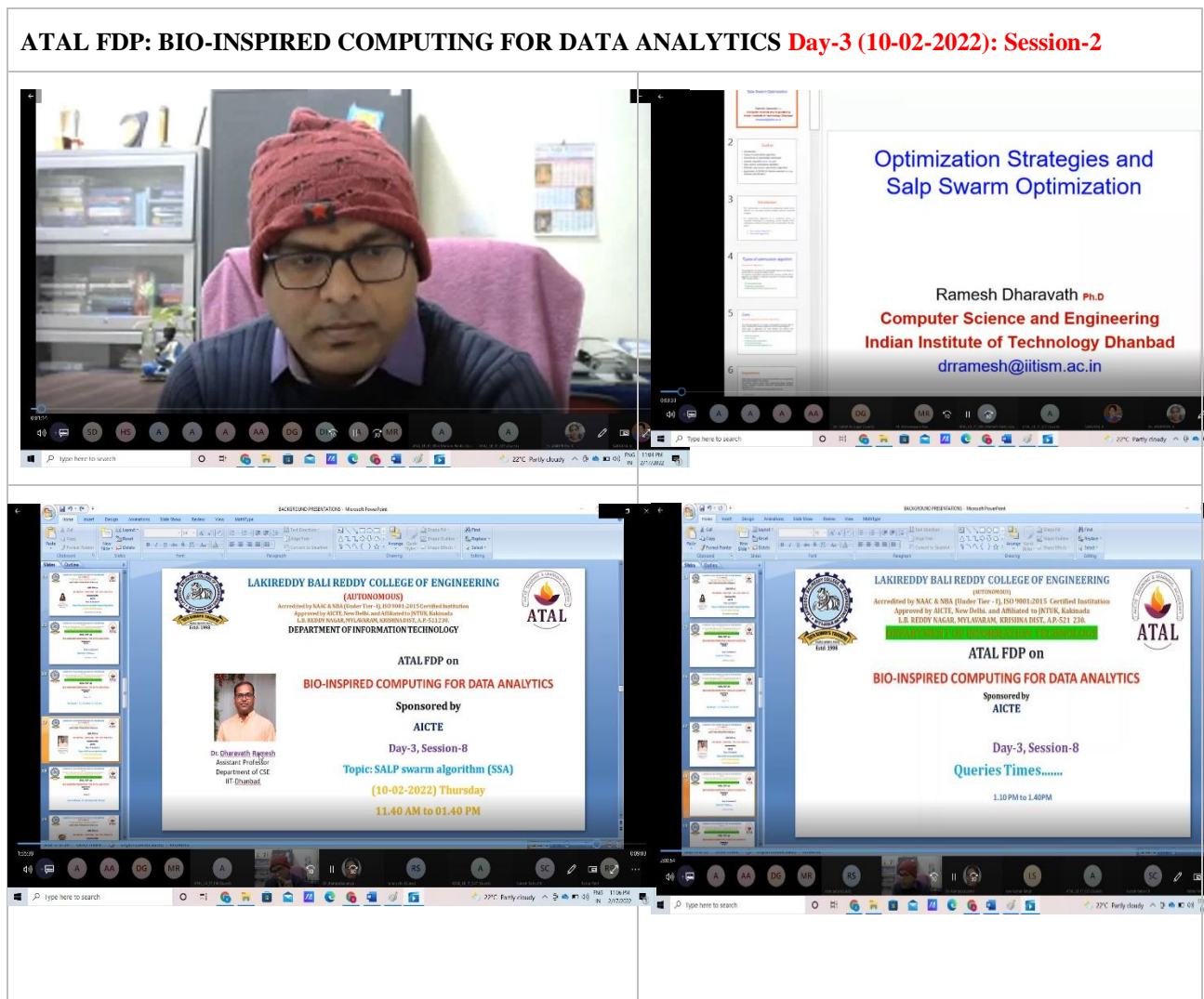


Fig. 12: 10/02/2022 – Session 02 by Dr. Dharavath Ramesh on SALP swarm algorithm (SSA)

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Session: 03

Topics: Optimization using Genetic algorithm for Data Analytics

Resource Person: Dr. Venkata Naresh Babu Kuppili, Assistant Professor, Dept. of CSE, NIT-Goa

Dr. Venkata Naresh Babu Kuppili, has presented the Genetic Algorithms for Data Analytics. In his speech, covered the search optimization, especially covered the Guided Random Search Techniques. In his talk presented the genetic algorithm with suitable applications. Further, he explained detailly about TSP using genetic algorithm with examples.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-3 (10-02-2022): Session-3

Genetic Algorithm for Data Analytics

by
Dr. Venkatanaresbhabu K
Dept. of CSE,
Assistant Professor,
NIT Goa

String no.	Initial population	X value	Fitness $f(x) = x^2$	P_i	Expected count $(n \cdot P_i)$
1	01101	13	169	0.14	0.58
2	11000	24	576	0.49	1.97
3	01000	8	64	0.05	0.22
4	10011	19	361	0.508	1.23

So, the string 2 has maximum chance of selection using Roulette-Wheel (RW)
So, sum of fitness = 1170
Average of fitness = 293
Max of fitness = 576

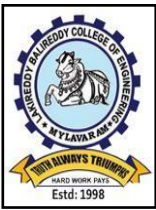
Feature Selection

X1	X2	X3	X4	X5	X6	
0.1	0.8	0.6	0.2	0.1	0.4	x1 x4 x5
0.2	0.8	0.6	0.9	0.5	0.4	0.1 0.2 0.1
0.3	0.8	0.6	0.2	0.8	0.2	0.2 0.9 0.5
0.3	0.2	0.8				0.3 0.2 0.8

Accuracy = 70%
Accuracy = 90%
Accuracy = 80%
Accuracy = 98%

Thank You

Fig. 13: 10/02/2022 – Session 03 by Dr. Venkata Naresh Babu Kuppili on Optimization using Genetic algorithm for Data Analytics



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Department of Information Technology

Day 4: 11/02/2022 (Sessions: 01 to 03)

Session: 01

Topics: Applications of SLAP for IoT

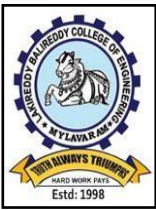
Resource Person: Dr. Dharavath Ramesh, Associate Professor, Dept. of CSE, IIT-Dhanbad.

Dr. Dharavath Ramesh has given lecture talk on the SALP application especially covered about IoT enabled computing for Fog/Cloud environment. In his talk presented the concepts fog computing and suggested to work for optimization algorithms in cloud environment. In his talk, covered the new offloading strategies which includes SALP, fitness based Quasi Reflection and Fuzzy inference system. At end, he suggested all the participants to do research on this area in a better way and publish in good journals .

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-4 (11-02-2022): Session-1

The figure consists of four screenshots from a video lecture. The top-left screenshot shows the title slide: "SALP Application: IoT Enabled Computing for Fog/Cloud environment" by Ramesh Dharavath, Ph.D., Computer Science and Engineering, Indian Institute of Technology Dhanbad. The top-right screenshot shows the "Outline" slide, which lists the following topics: Introduction, Internet of Things, Architecture of IoT, Key issues faced by IoT, Smart Solution, Offloading Criteria, Example, and Proposal of new Offloading Strategy (including Background, Salp Swarm Algorithm, Fitness Based Quasi Reflection method, Fuzzy Inference System, and Proposed Methodology). The bottom-left screenshot shows the "Internet of Things (IoT): A Converged Entity" slide, which includes a diagram of various IoT devices and a definition: "The Internet of Things (IoT) is the network of physical objects devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity that enables these objects to collect and exchange data." The bottom-right screenshot shows the "Result Analysis" slide, which displays four bar charts (a, b, c, d) comparing the "Cost Evaluation of Cybershake" for different parameters.

Fig. 14: 11/02/2022 – Session 01 by Dr. Dharavath Ramesh on Applications of SLAP for IoT



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Session: 02

Topics: Feature subset selection using Bio-inspired algorithms

Resource Person: Dr. Cherukuri Ramalinga Swamy, Assistant Professor, Dept. of CSE, NIT-Warangal

Dr. Cherukuri Ramalinga Swamy has delivered a talk on dimensionality reduction on feature selection. He also discussed about how to use optimization or swarm intelligence algorithms to implement feature selection. Also provided the deep concept about PCA concepts. Also in his talk given more information about syed mirjali blog to do research studies in the optimization techniques.

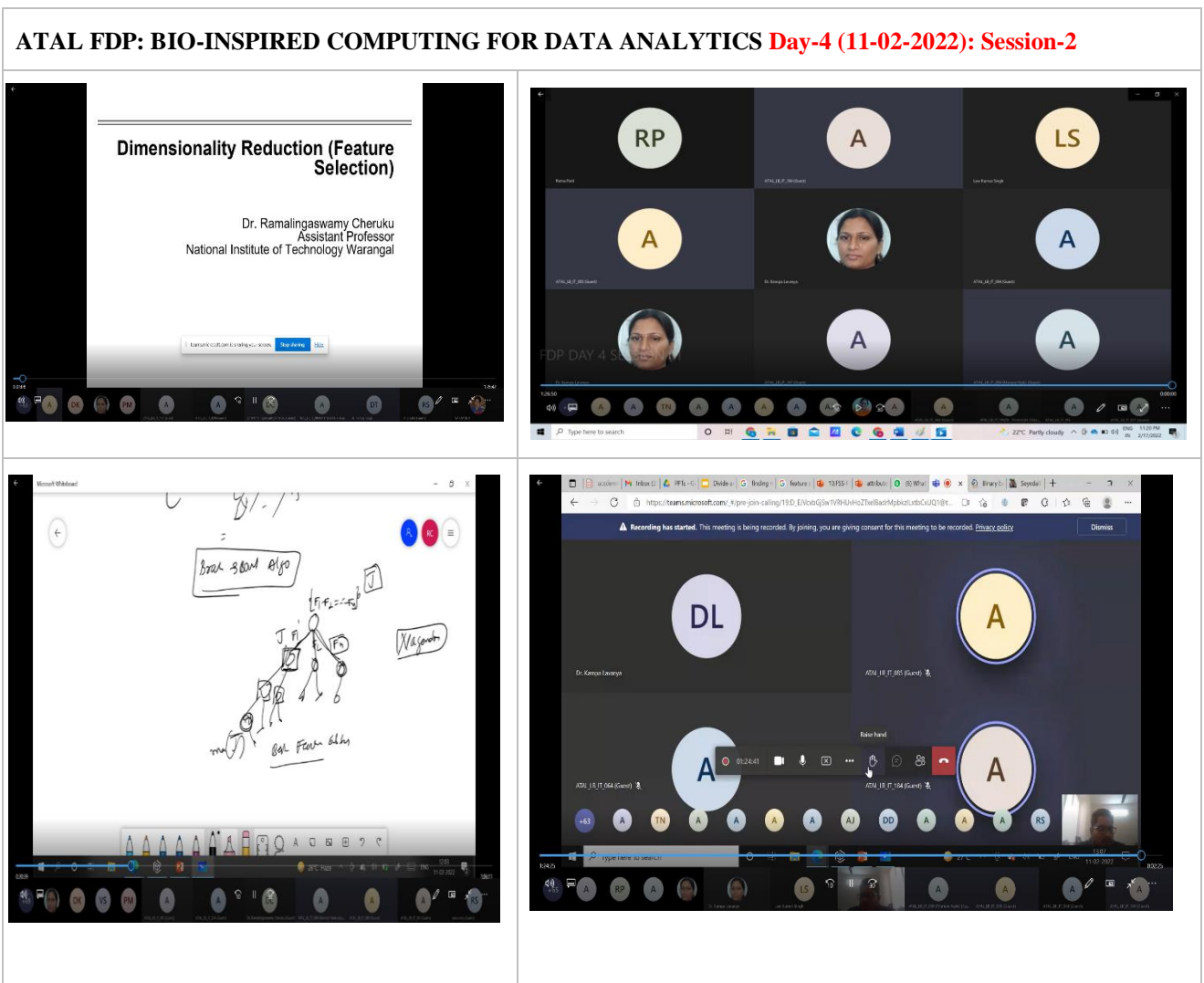


Fig. 15: 11/02/2022 – Session 02 by Dr. Cherukuri Ramalinga Swamy on Feature subset selection using Bio-inspired algorithms

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Department of Information Technology

Session: 03

Topics: Deep learning based on bio-inspired computing

Resource Person: Dr. W Wilfred Godfrey, Assistant Professor, Dept. of CS, ABV-IIITM-Gwalior

Dr. W Wilfred Godfrey has presented the importance of swarm intelligence in the deep learning. In his talk covered about the biological inspiration and neuron computation. Provided the artificial neural networks techniques in a detailed way in his talk. He has given deep insights about components of search techniques with examples. Further, he explained detailly about generalization performance.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-4 (11-02-2022): Session-3

ATAL FDP on BIO-INSPIRED COMPUTING FOR DATA ANALYTICS

Sponsored by AICTE

Day-4, Session-12

Topic: Deep learning based on bio-inspired computing

(11-02-2022) Friday

02:10 PM to 04:10 PM

Dr. W Wilfred Godfrey
Assistant Professor
Department of CSE
ABV-IIITM-Gwalior

Does brain do deep learning?

- Architectural similarity between CNNs and visual cortex
- Similarity of the receptive fields of CNNs and direction selective cells

Zeiler and Fergus, 2014

Hubel and Wiesel, 1959

Generalization performance

"biological training" MNIST: 0.585

end-to-end training: 2.278

error, %

number of epochs

BP train

BIO train

Conclusions

Fig. 16: 11/02/2022 – Session 03 by Dr. W Wilfred Godfrey on Deep learning based on bio-inspired computing

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Department of Information Technology

Day 5: 12/02/2022 (Sessions: 01 to 03)

Session: 01

Topics: Hands-on – Data analysis using Python

Resource Person: Dr. W Wilfred Godfrey, Associate Professor, Dept. of CSE, ABV-IIITM- Gwalior

Dr. W Wilfred Godfrey has presented the importance of swarm intelligence in the deep learning.

In his talk covered about the biological inspiration and neuron computation. Provided the artificial neural networks techniques in a detailed way in his talk. He has given deep insights about components of search techniques with examples. Further, he explained detailly about generalization performance.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-5 (12-02-2022): Session-1

The figure consists of four screenshots from a video recording of a session. The top-left screenshot shows a presentation slide for 'ATAL FDP on BIO-INSPIRED COMPUTING FOR DATA ANALYTICS' by Dr. W Wilfred Godfrey, Assistant Professor at ABV-IIITM-Gwalior. The top-right screenshot shows a Jupyter Notebook with Python code for a Genetic Algorithm (GA) with fitness function and particle initialization. The bottom-left screenshot shows handwritten notes on a digital whiteboard explaining GA parameters like population size, fitness, and selection. The bottom-right screenshot shows the Jupyter Notebook output showing the GA execution progress and the final best solution found.

Fig. 17: 12/02/2022 – Session 01 by Dr. W Wilfred Godfrey on Hands-on – Data analysis using Python



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Session: 02

Topics: Optimization of Biometric Recognition System

Resource Person: Dr. Surya Prakash, Associate Professor, Dept. of CSE, IIT-Indore

Dr. Surya Prakash has presented the concept of image processing how it can be improvised using optimized algorithms. In his talk, delivered the image enhancement technique using the Artificial Bee Colony algorithm in a detailed. He has given deep insights about the concept of swarm intelligence in the image enhancement. Further, sir is also announced the Ph.D internship in their institute.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-5 (12-02-2022): Session-2

Image Contrast Enhancement using Artificial Bee Colony (ABC)

Dr. Surya Prakash
Associate Professor
Department of Computer Science & Engineering
Indian Institute of Technology Indore, Indore-453552, INDIA
E-mail: surya@iiti.ac.in

Steps: Quality Estimation based on Band Limited Contrast

- Normalized value of quality between 0 and 1 is obtained as follows:

$$Q_{IC} = 1 - \frac{Q_c}{10 * N_B}$$

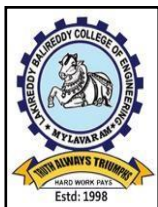
where N_B is total number of blocks in an image.

Experimental Results

Input Image	GA[10]	ABC[11]	Proposed technique
g1	14.16	23.64	24.20
g2	13.21	12.18	24.11
g3	13.75	17.42	24.14
g4	20.12	20.16	31.24
g5	19.92	24.84	26.40

Computed PSNR values for the proposed technique are compared with the same obtained in [9] and [10].

Fig. 18: 12/02/2022 – Session 02 by Dr. Surya Prakash on Optimization of Biometric Recognition System



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Date: 12/02/2022

Valedictory Session

On the Valedictory Session, our Principal, **Dr. K. Appa Rao** and **Dr. B.Srinivasa Rao**, Professor & HOD, Department of IT, **Dr. K.Lavanya**, Coordinator of FDP, and Co-Coordiators of the FDP **Dr. K. Anu Priya**, **Dr. B. Rama Devi**, & **Mrs. A. Sarvani** presented.

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Department of Information Technology

Welcome to Valedictory
of **Date:12/02/2022 ,2.30 P.M**
ATAL Academy Sponsored Faculty Development Program(FDP)
on
BIO-INSPIRED COMPUTING FOR DATA ANALYTICS
(Virtual Mode)
08th - 12th February 2022

Principal
Dr. K. Appa Rao
LBRCE(A), Mylavaram

Dean of Academics
Dr. M. Srinivasa Rao

Convener
Dr. B. Srinivasa Rao

Coordinator
Dr. K. Lavanya

Co-Coordiators
Dr. K. Anupriya
Dr. B. Rama Devi

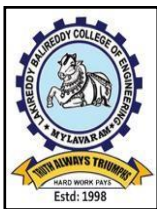
Fig.19: Valedictory Banner of ATAL FDP

Dr. K. Appa Rao, Principal, congratulate all the participants, convener, coordinator, co-coordinators, and department of IT for the successful completion of the ATAL FDP on “**BIO-INSPIRED COMPUTING FOR DATA ANALYTICS**”. He also informed to all the participants share your knowledge gain in this workshop to your students. At the outcome student need to implement good projects in this area.

Dr. K.Lavanya, Coordinator of FDP, in her valedictory speech thanked ATAL Academy for sanctioning the FDP to our Department. Then she thanked all the Resource Persons Dr. Surya Prakash, Dr. Dharavath Ramesh, Dr. E. Damodar Reddy, Dr. Trilochan Panigrahi, Dr. Venkata Naresh Babu Kuppili, Dr. Cheruku Ramalinga Swamy, Dr. Lavika Goel Malaviya, Dr. W Wilfred Godfrey and Dr. Venkatesh Pandiri for taking the sessions in this program. After that, she thanked all the participants for their active participation. She then thanked the faculty members and staff of the department for their continuous support and cooperation to her for conducting the FDP in a smooth and successful manner.

Dr. B.Srinivasa Rao, Professor & HOD, Department of IT, Convener, in his valedictory speech thanked ATAL Academy for sanctioning the FDP to our Department. Then he thanked the Resource

ATAL FDP on “BIO-INSPIRED COMPUTING FOR DATA ANALYTICS” 08th Feb. 2022 to 12th Feb. 2022 Organized by Department of IT, LBRCE (A), Mylavaram



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Persons for accepting the request and taking sessions in the FDP. After that, he said that all the participants should share the knowledge gained in this FDP for their research and to students of their institutions and requested them to train the students to do projects on Bio-inspired computing and data science related concepts.

ATAL FDP: BIO-INSPIRED COMPUTING FOR DATA ANALYTICS Day-1(08-02-2022): Session-1

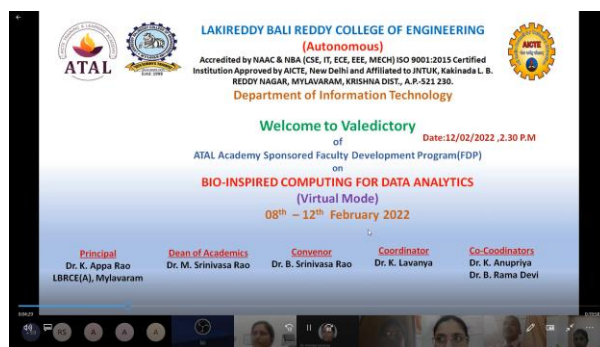
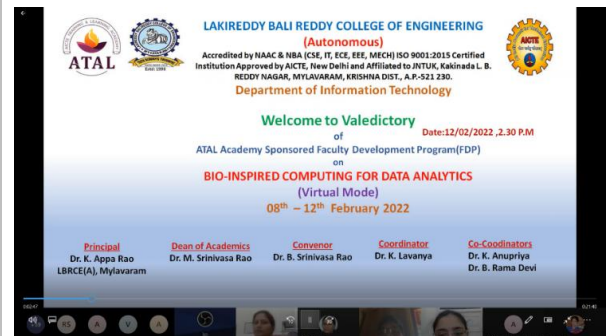
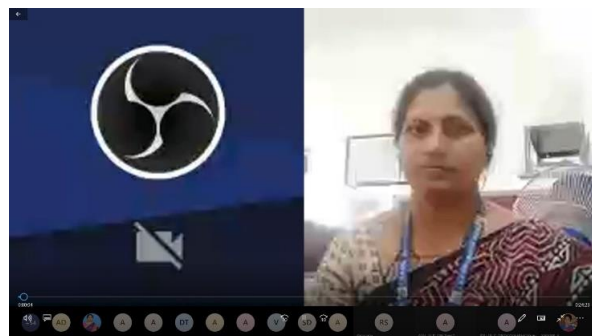


Fig. 20: Valedictory Speech by Dr. K. Appa Rao, Principal, LBRCE (A), Dr. B. Srinivasa Rao, Convener, HoD, Dept. of IT, and Dr. K. Lavanya, Coordinator, Associate Professor, Dept. of IT

At the end of the valedictory session, vote of thanks was given by Mrs. A. Sarvani, team member of the FDP in which she has been paid her gratitude towards all the participants who has spared their valuable time for attending this FDP. She also expressed the gratitude to the Resource Persons, Principal, Head of the Department and Management for giving this valuable opportunity.

Coordinator
(Dr. K. Lavanya)

Convener
(Dr. B. Srinivasa Rao)

Principal
(Dr. K. Appa Rao)

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