Department of
Electronics and Communication Engineering

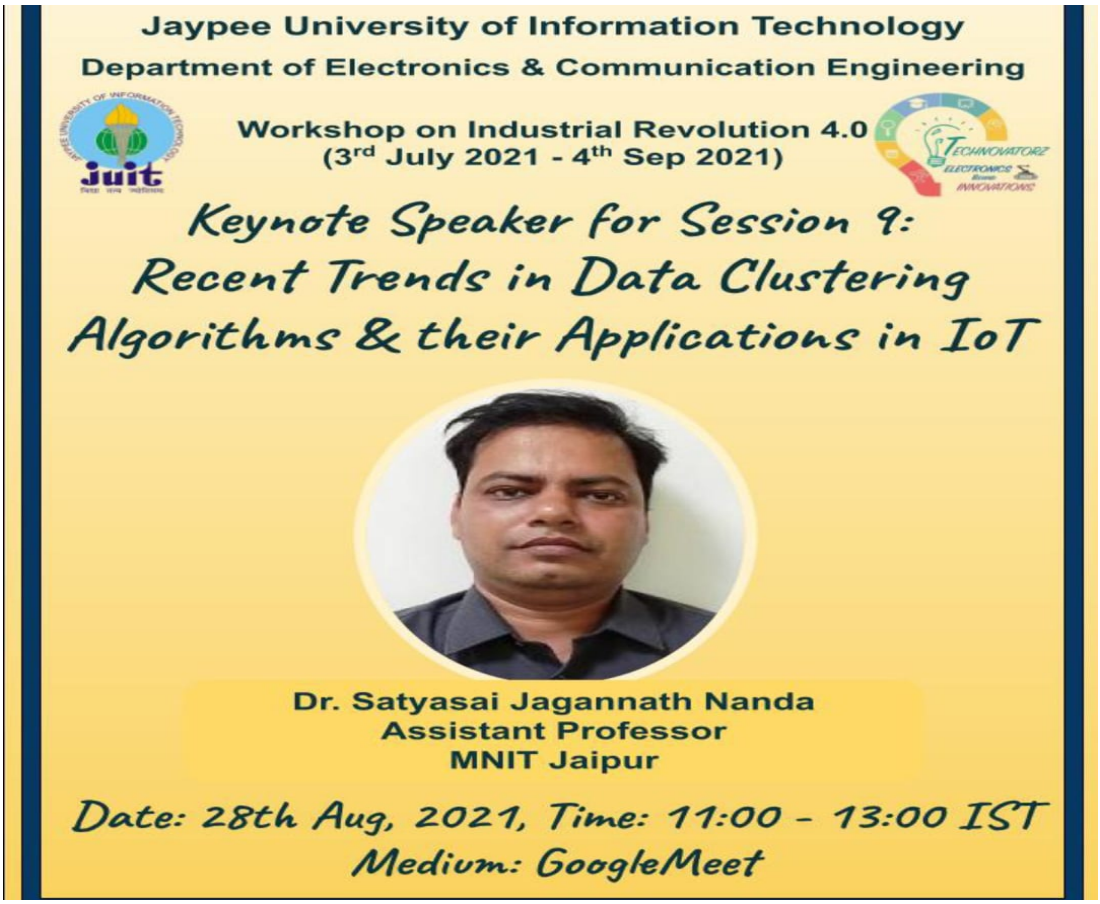
Jaypee University of Information Technology
Waknaghat

WORKSHOP ON INDUSTRIAL REVOLUTION 4.0

Event Report: Session-9

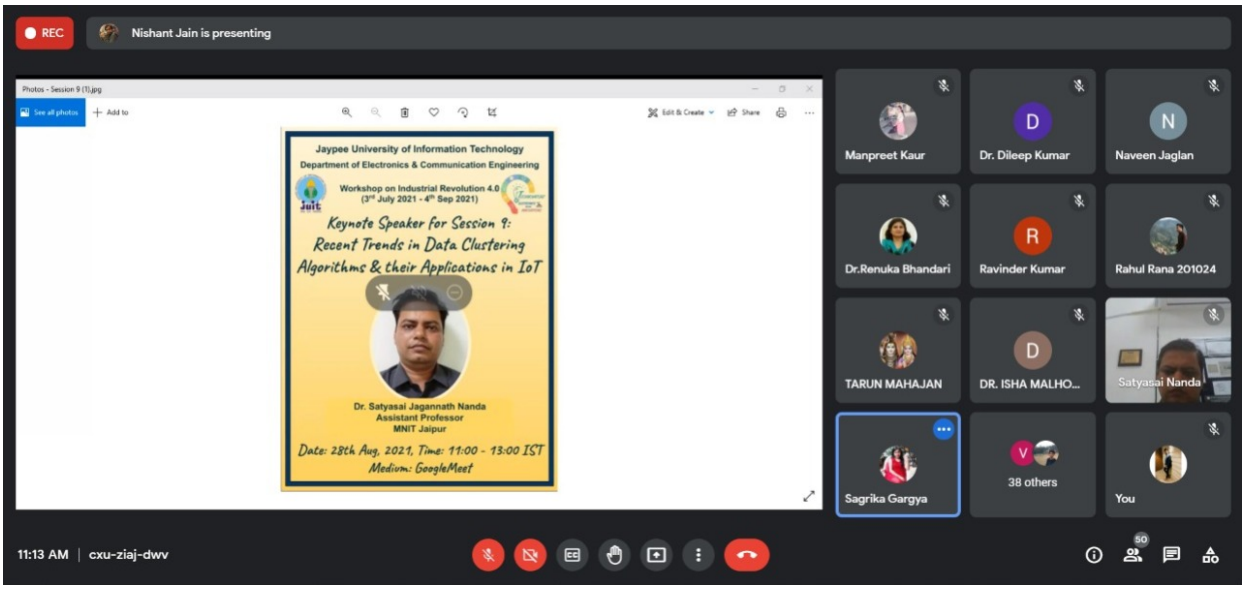
28th August, 2021

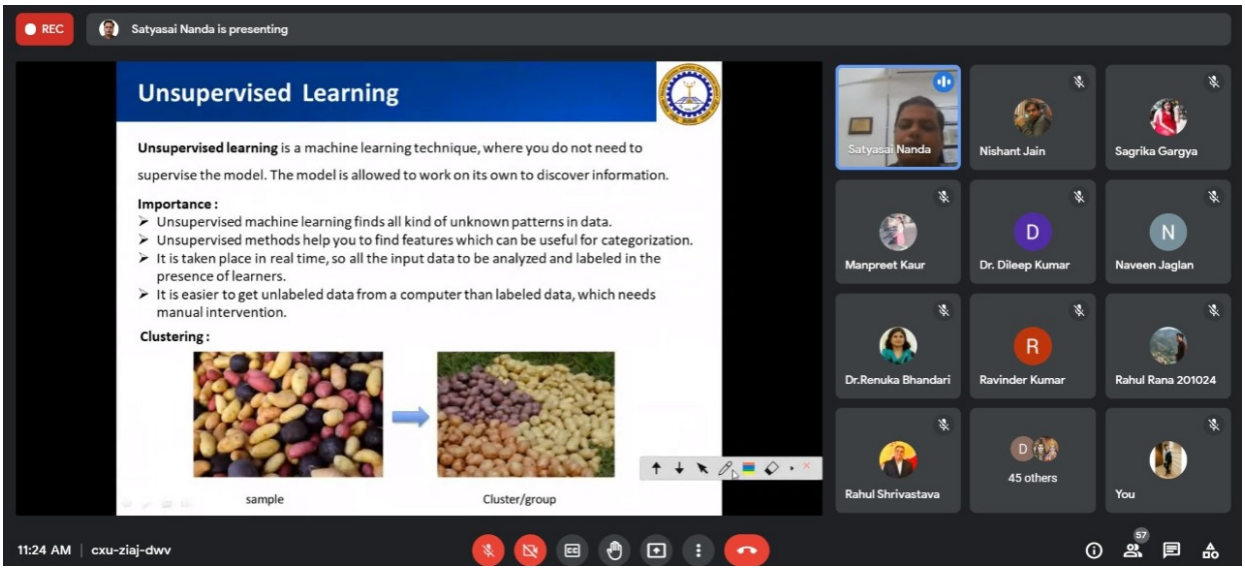
Department of Electronics and Communication Engineering of Jaypee University of Information Technology, Solan organized an amazing 9th session of "Workshop on Industrial Revolution 4.0" on 28 August 2021. The topic of the 9th session was **"Recent Trends in Data Clustering Algorithms & their Applications in IoT"** delivered by our honorable speaker **Dr. Satyasai Jagannath Nanda, Assistant Professor, MNIT Jaipur.**



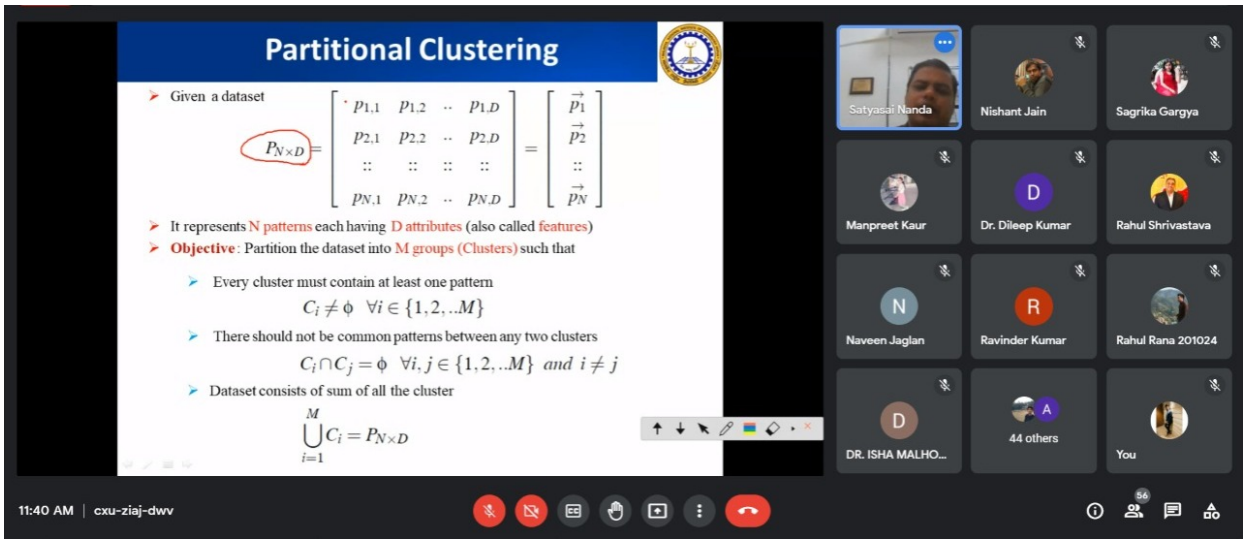
Our eminent speaker introduced by Ms. Pragya and Ms. Sagrika from the branch of

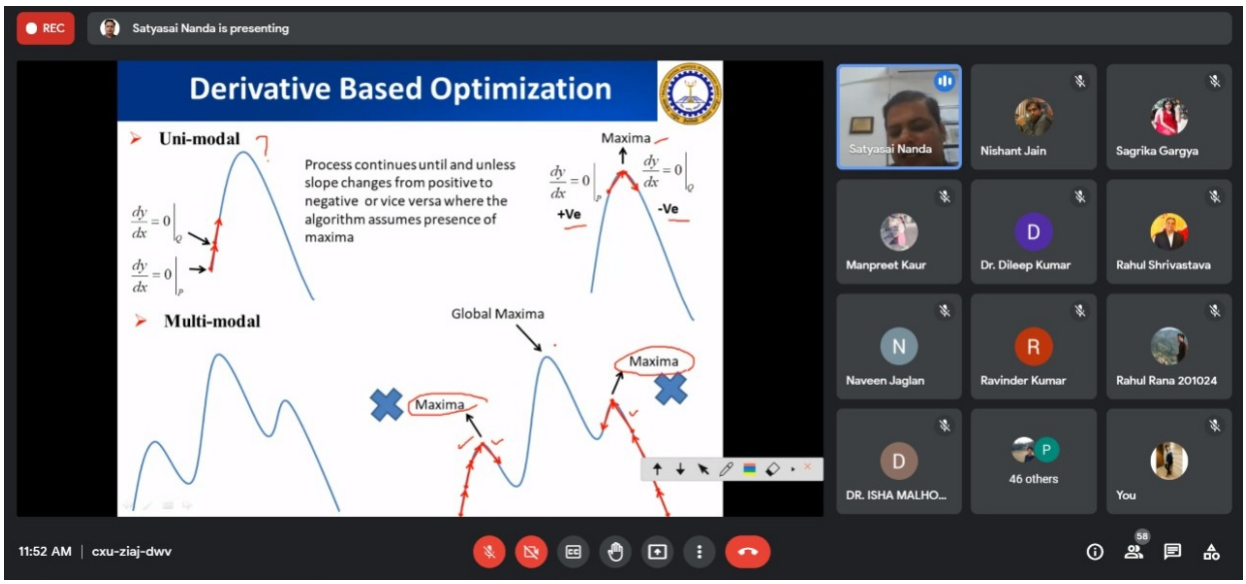
Electronics and Communication Engineering served as an inspiration to several participants & students by delivering their motivation towards the field of IOT.



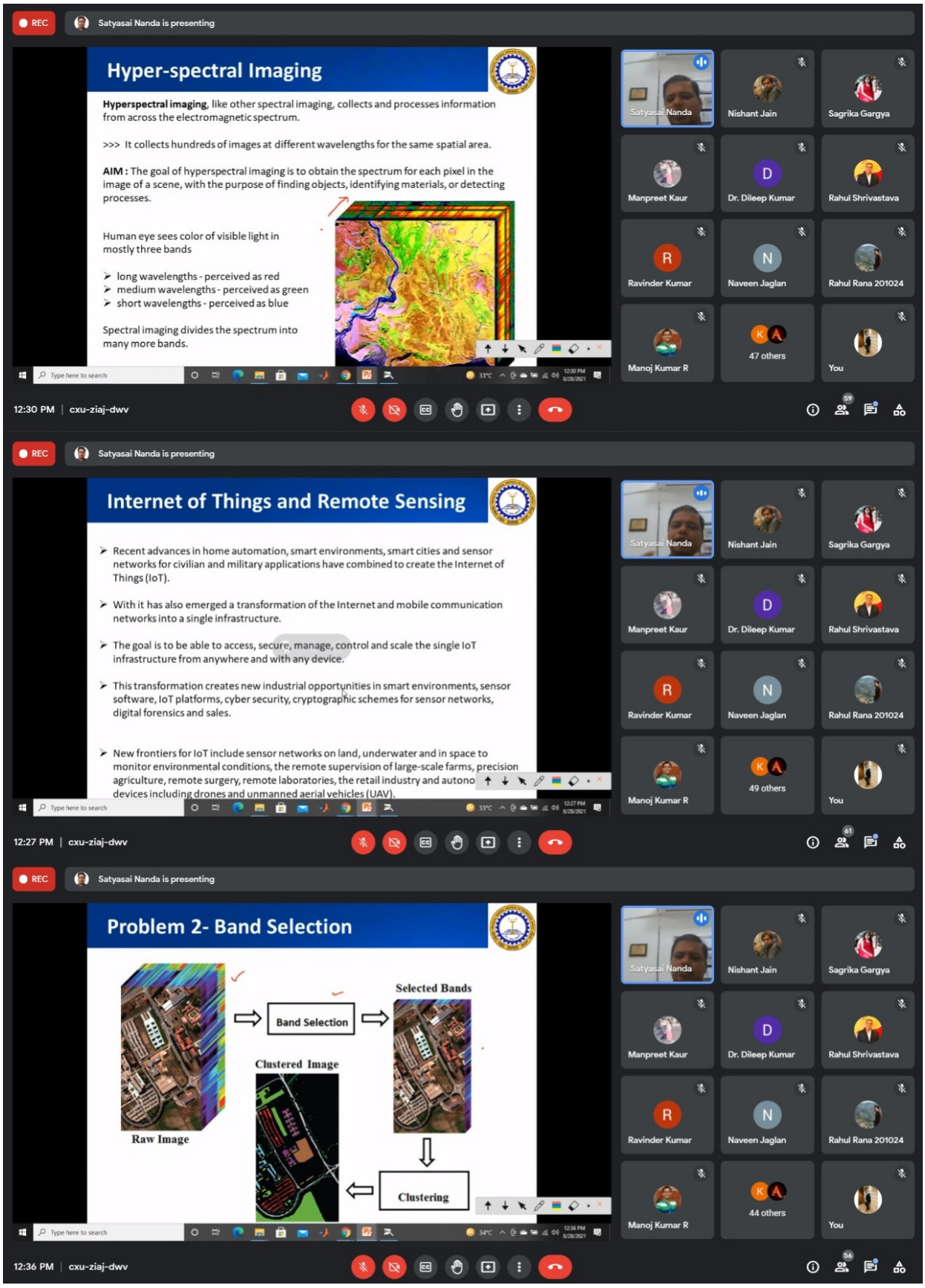


He also gave us the knowledge about the clustering and the importance of unsupervised learning in the field of IoT. With vast knowledge in the field of IOT, Dr. Nanda explained the algorithms of data clustering and their applications in IOT in day to day life. He continued explaining its optimization, computation and how it is applicable and used nowadays in every field.

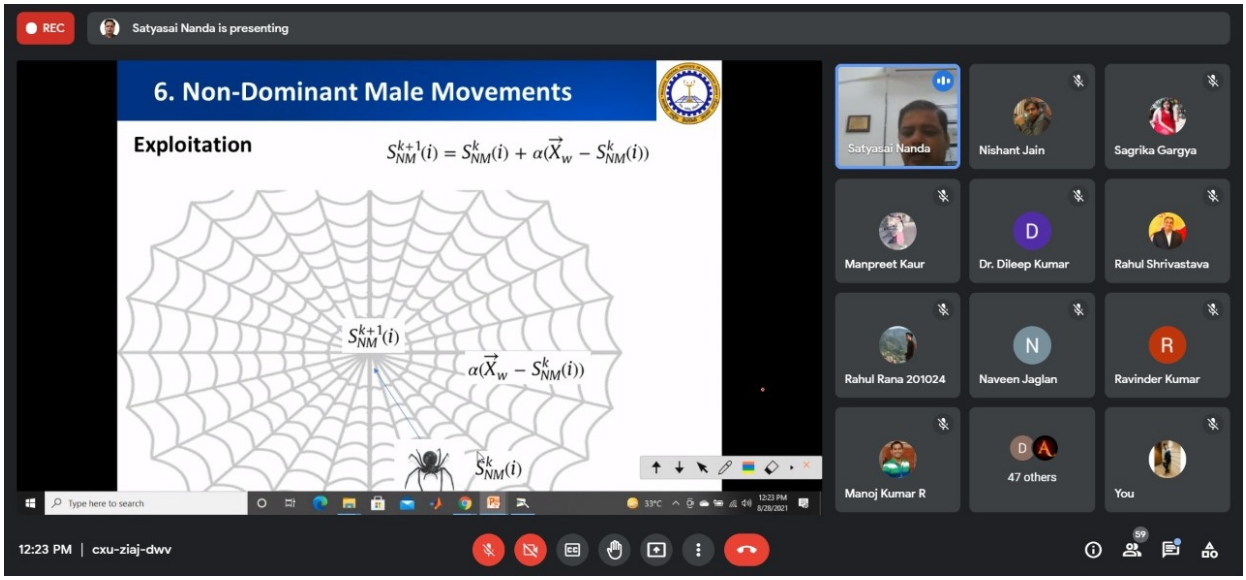

Partitional Clustering
Given a dataset
$P_{N\times D} = \begin{bmatrix} p_{1,1} & p_{1,2} & .. & p_{1,D} \\ p_{2,1} & p_{2,2} & .. & p_{2,D} \\ :: & :: & :: & :: \\ p_{N,1} & p_{N,2} & .. & p_{N,D} \end{bmatrix} = \begin{bmatrix} \vec{p_1} \\ \vec{p_2} \\ :: \\ \vec{p_N} \end{bmatrix}$
It represents N patterns each having D attributes (also called features)
Objective: Partition the dataset into M groups (Clusters) such that
Every cluster must contain at least one pattern
$C_i \neq \phi \quad \forall i \in \{1,2,..M\}$
There should not be common patterns between any two clusters
$C_i \cap C_j = \phi \quad \forall i,j \in \{1,2,..M\} \text{ and } i \neq j$
Dataset consists of sum of all the cluster
$\bigcup_{i=1}^{M} C_i = P_{N\times D}$
Satyasai Nanda
Nishant Jain
Sagrika Gargya
Manpreet Kaur
Dr. Dileep Kumar
Rahul Shrivastava
Naveen Jaglan
Ravinder Kumar
Rahul Rana 201024
DR. ISHA MALHO...
44 others
You
11:40 AM | cxu-ziaj-dwv

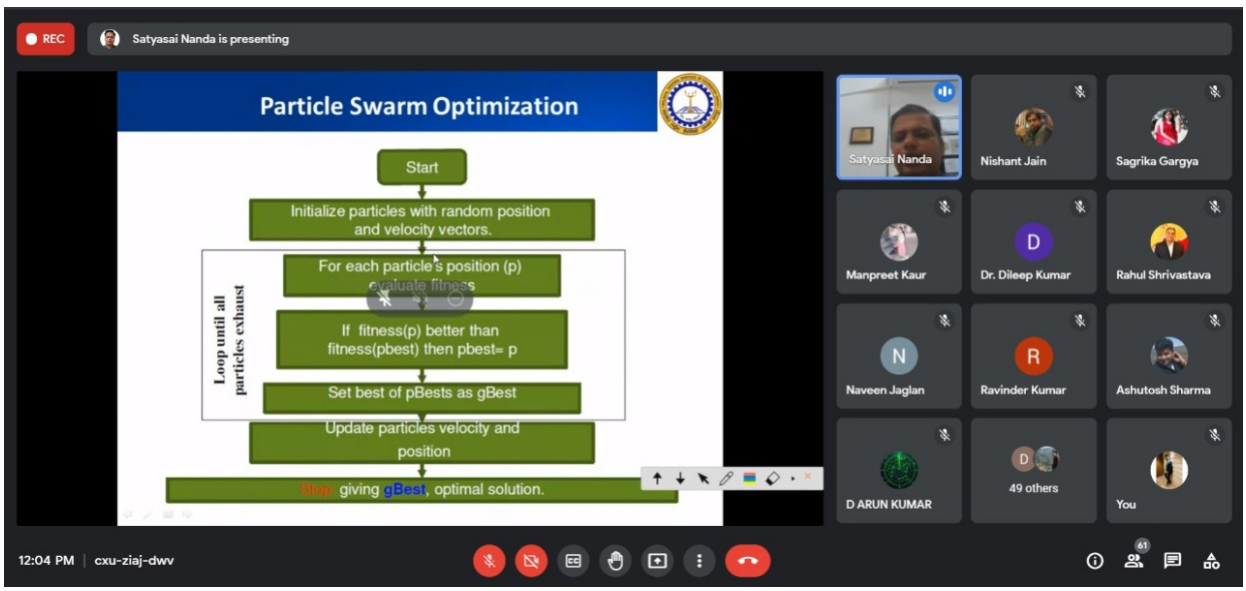

REC
Satyasai Nanda is presenting
Derivative Based Optimization
Uni-modal
Process continues until and unless slope changes from positive to negative or vice versa where the algorithm assumes presence of maxima
Maxima
+Ve
-Ve
Multi-modal
Global Maxima
Maxima
Maxima
Satyasai Nanda
Nishant Jain
Sagrika Gargya
Manpreet Kaur
Dr. Dileep Kumar
Rahul Shrivastava
Naveen Jaglan
Ravinder Kumar
Rahul Rana 201024
DR. ISHA MALHO...
46 others
You
11:52 AM | cxu-ziaj-dwv

He also explained the IOT and remote sensing, hyper spectral imaging etc. and also about the various IOT applications in Industry 4.0 ‘The 9th Industrial Revolution’. He broadly explains about the data clustering algorithms and its applications. And also shared some problems like Band Selection and its clustered image.



Two hour session on the trends in data clustering and their applications in IOT was great, participants gained a lot of knowledge in this field and they really appreciated this session. Hoping to implement the knowledge we gained during the session in future.





In the conclusion, the several doubts were cleared and developed immense interest in the applications of IOT and data clustering algorithms. The session was worthy and taught us lot of things.