Machine learning and Deep learning using MATLAB

On 19th June 2020 @11:30 AM

Organised By:

DEPARTMENT OF MATHEMATICS

RAJIV GANDHI UNIVERSITY

RONO HILLS, DOIMUKH-791112

in association with

ELMAX SYSTEMS AND SOLUTIONS,

MATHWORKS (MATLAB AND SIMULINK) AND

DEPARTMENT OF COMPUTER SC. & ENGG., RGU

Duration: 1 hour 45 minutes

Report Date: 20/06/2020

Department of Mathematics, Rajiv Gandhi University organized a Free Webinar on **"Machine learning and Deep learning using MATLAB"** in association with Elmax Systems and Solutions, MathWorks (MATLAB and SIMULINK) and Department of Computer Sc. & Engg., Rajiv Gandhi University for faculty members and research scholars on 19th June 2020. Elmax Systems and Solutions work on cutting edge technologies delivering smart development, research and support to academic institutions.

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ACKNOWLEDGEMENT

EXECUTIVE SUMMARY

Department of Mathematics, Rajiv Gandhi University organized a Free Webinar on **"Machine learning and Deep learning using MATLAB"** with an objective to provide the faculty with an understanding of Machine learning and Deep learning using MATLAB. Department of Mathematics, Rajiv Gandhi University in association with Elmax Systems and Solutions, MathWorks (MATLAB and SIMULINK) and Department of Computer Sc. & Engg., Rajiv Gandhi University organized the webinar from 19 June 2020. Eminent resource person from the field of Artificial intelligence handled technical session.

There are many people who contributed a lot for organizing the programme successfully. I express my sincere gratitude to each and every one who made this programme a success. First of all, I would like to thank Hon'ble Vice Chancellor of Rajiv Gandhi University for allowing us to organize this significant programme. I express my heartfelt gratefulness to Elmax Systems and Solutions, MathWorks (MATLAB and SIMULINK) and Department of Computer Sc. & Engg., Rajiv Gandhi University for their constant support. I take this privilege to express my cordial appreciation to the Resource Person for giving his valuable time and sharing their wisdom through their course material during the webinar. I thank all the participants for actively participating in the programme. Last but not least I express thanks to my colleagues and students for their continuous and positive support. It was a well organized training with a lot of inputs provided and the sessions were very informative. There were many topics covered during the program and I hope the shared course materials could spark some interest and ignite a passion to learn more about it. The details of the technical sessions are provided in detail in this report.

Thanking you.

Dr. Saifur Rahman
Convener of the webinar,
Department of Mathematics,
Rajiv Gandhi University (A Central University),
Rono Hills, Doimukh – 791112
Arunachal Pradesh, India

1. PREFACE

1.1. ABOUT THE HOST INSTITUTION

1.1.1. *Rajiv Gandhi University*

Rajiv Gandhi University (formerly Arunachal University) is the premier institution for higher education in the state of Arunachal Pradesh and has completed twenty five years of its existence. Late Smt. Indira Gandhi, the then Prime Minister of India, laid the foundation stone of the university on 4th February 1984 at Rono Hills, where the present campus is located. Ever since its inception, the university has been trying to achieve excellence and fulfill the objectives as envisaged in the University Act. The University got academic recognition under section 2(f) from the University Grants Commission on 28th March, 1985 and started functioning from 1st April, 1985. It got financial recognition under section 12-B of the UGC on 25th March, 1994. Since then Rajiv Gandhi University then Arunachal University has carved a niche for itself in the educational scenario of the country following its selection as a University with potential for excellence by a high level expert committee of University Grants Commission from among universities in India. The University was converted into a Central University with effect from 9th April 2007 as per notification of Ministry of Human Resource Development, Government of India.

The Faculty members have been actively engaged in research activities with financial support from UGC and other funding agencies. Since inception, a number of proposals on research projects have been sanctioned by various funding agencies to the University. Departments have organized a number of Seminars, Workshops and Conferences. Many faculty members participated in national and international conferences and seminars held within the country and abroad. Eminent scholars and distinguished personalities have visited the University and delivered lectures on various disciplines.

The academic year 2000-2001 was a year of consolidation for the University. The switch over from annual to semester system took off smoothly and the performance of the students registered a marked improvement. Various syllabi designed by Boards of Post-Graduate Studies (BPGS) have been implemented. VSAT facility installed by the ERNET India, New Delhi under UGC-Infonet program, provides internet access.

In spite of infrastructural constraints, the University has been maintaining its academic excellence. The University has strictly adhered to the academic calendar, conducted the examinations and declared the results in time. The students from the University have found placements not only in State and Central Government Services, but also in various institutions, industries and organizations. Many students have come out successful in the National Eligibility Test (NET). Since inception; the University has made significant progress in teaching, research, innovations in curriculum development and developing infrastructure.

1.1.2. Department of Mathematics

The Department of Mathematics is an important constituent of the Faculty of Basic Sciences since 2005, the year when it was established. The department offers two-years (Four Semesters) M. A./M. Sc. programme in Mathematics & Computing and total intake capacity of P. G. programme is 40 (Forty). In addition, we offer M. Phil. (Four Semesters) programme with seat capacity Five since 2015. Apart from these, the department of Mathematics has started Ph. D. programme from 2013 in Mathematics & Computing with seven scholars in different research domains of Pure and Applied Mathematics.

Our faculty members specialize in various areas of Algebra, Analysis, Number Theory and Applied Mathematics. The department aims to train people who are oriented towards research and teaching in advanced areas of Pure and Applied Mathematics. The objectives of the department are to impart quality education to those seeking admission to M. Sc., M. Phil. and Ph. D. programmes, promote theoretical and applied research, publish original works and develop interaction with other departments of the university, R&D establishments, industries and other organizations.

1.2.   ABOUT THE SPONSORING AGENCY

The program is fully funded by ELMAX Systems and Solutions, Kolkata.
Address : ELMAX Systems and Solutions , GROUND FLOOR, A77, Jodhpur Gardens, Lake Gardens, Kolkata, West Bengal 700045

1.3.   BACKGROUND

Through this industry associated webinar, we tried to build the next generation of technology developers and participants to achieve the practical knowledge from Big data experts. This webinar helped people unfamiliar with data science to put next gear in learning and research.

1.4.   SIGNIFICANCE AND OBJECTIVES OF THE webinar

1. The objectives are to provide the faculty and/or students with an understanding of Machine learning and Deep learning using MATLAB.
2. The learning outcomes include being able to identify MATLAB as research tool and environment commonly used in statistical computing, data analytics and scientific research.
3. MATLAB is one of the most popular tools used by statisticians, data analysts, researchers and marketers to retrieve, clean, analyze, visualize and present data. Due to its expressive syntax and easy-to-use interface, it has grown in popularity in recent years.
4. To bring the participants to the level of depth necessary in the subject matter to achieve the stated objectives.
5. To encourage participation in the National Agenda of knowledge building through online distance education mode in the lockdown period due to novel corona virus (COVID-19)

6. To introduce the participants with the basics of MATLAB and increasing their interest in MATLAB as research tool and also to provide resources that will support their classroom instruction as well as in their research.

1.5.   EXPECTED OUTCOMES

The purpose of this webinar is to enable the participants to apply the skills learned through various video tutorials and presentation of the webinar. Participation in this webinar will enable the participants to learn how to utilize the Machine learning and Deep learning infrastructure in a better and productive way.

This webinar seeks to bridge the divide between what has traditionally been viewed as the sole objective of Information Technology and what CAN be the triple bottom line for forward-thinking Information Technology: its real application, ease of use, advancements and profit.

1.6.   THEMES AND SUB-THEMES

It was a one day webinar which aimed at providing valuable information to the entire faculty of the Departments. The main motive of this programme was to enhance the best techniques of teaching methods in the present day and to update the knowledge of the faculty within special focus on Machine learning and Deep learning.

1.6.1. SUB-THEMES

The success of this webinar is due to the peculiar themes of this program:

- **In person**. It was increasingly feasible to create and sustain virtual networks using resources such as videoconferencing and web 2.0 communications, which allowed substantial value in bringing people together to be immersed in a common experience. Personal interactions also allow for informal communication outside the defined schedule that can be valuable to the network-building process.

- **Team-based**. A key element for ensuring success and enhancing sustainability in this webinar is the participation of teams from institutions, including a range of junior to senior members on each team. The adopted webinar model has shown added success and commitment by participants if their home institute provides at least modest resources to help implement what faculty learns.

1.7.   BUDGET

The webinar was conducted in the online platform. Rajiv Gandhi University has no financial liability for organizing this webinar. The program is fully funded ELMAX Systems and Solutions, Kolkata and the expenditure is borne by them.

1.8.   MODUS OPERANDI

To encourage participation in the National Agenda of knowledge building through online distance education mode in the lockdown period due to novel corona virus (COVID-19)

2. SESSION WISE DELIBERATIONS

2.1.   INAUGURAL SESSION

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Duration: 1 hour 45 minutes

PROGRAM SCHEDULE

11.20 am - 11:30 am	Participants Join the Meeting
11:30 am - 11:35 am	welcome Address by Dr. Saifur Rahman, convener
11:35 am - 11:40 am	Introduction of the webinar by Prof. Dr. Firos A, secretary
11:40 am - 11:50 am	Inaugural Address by Chief Patron, **Prof. Saket Kushwaha**, Honorable Vise-Chancellor, Rajiv Gandhi university, Doimukh, Arunachal Pradesh
11:50 am - 1:10 pm	Technical Session handled by Mr.Debajit Sen, Head- Technical Project, ELMAX Systems and Solutions, Kolkata
1:10 pm - 1:30 pm	Discussion time
1:30 pm - 1:35 pm	Vote of Thanks by Dr. Saifur Rahman, convener

2.2.   PLENARY SESSIONS

NA

2.3. TECHNICAL SESSIONS

MATLAB is a useful software package to anybody who wishes to undertake extensive statistical computations (a user community that includes students, researchers and professionals belonging to various disciplines).

The resource person interacted with the presentation and interacted to the participants through *Google Meet*

The important points discussed by the resource person are:

- Auto ML function workflow
- Auto ML Frameworks for classification
- Algorithm Selection for Clustering using Meta-Learning
- Methods for estimating the Number of Clusters

He also emphasized on the below points

- The present Auto ML systems take only supervised learning algorithms and their hyperparameters into account. None of them applies them to unsupervised learning like clustering.
- The methods for selecting clustering algorithms all rely on meta-learning, but they neglect the estimation of the hyperparemters.
- Each work that use meta-learning for clustering uses a different set of meta-features. Thus, it is not clear which meta-features lead to the most promising results. There is also no work that uses the same set of meta-features that are used in the current Auto ML systems.
- The methods for estimating the hyperparameters for clustering do not use the methods that are used in Auto ML systems, e.g. Bayes optimization. They typically execute the clustering algorithm and subsequently evaluate the result for all values in a predefined range. The optimization methods can remedy this by only running and evaluating k values in the range until a predefined budget is exceeded. Hence, runtime savings should be able to achieve. However, the accuracy of these methods is unclear.

2.4. TARGET GROUP

Research scholars, PG students, faculty members and industry people in national level.

2.5. HOW THE WEBINAR WAS BENEFICIAL FOR THE PARTICIPANTS

The purpose of this webinar was to enable the participants to apply the skills learned through video presentations of the webinar. Participation in this webinar enabled the

participants to learn how to utilize the MATLSB infrastructure in a better and productive way.

This webinar seeks to bridge the divide between what has traditionally been viewed as the sole objective of Information Technology and what CAN be the triple bottom line for forward-thinking Information Technology: its real application, ease of use, advancements and profit.

2.6.   HIGHLIGHTS

- NO REGISTRATION FEE
- CERTIFICATE OF PARTICIPATION
- LEARN FROM HOME
- FOR FACULTIES/RESEARCHERS
- TUNED TO SUIT THE RESEARCHERS OF ALL DOMAIN

2.7.   THE COURSE DETAILS

1. Registration of webinar started Date: 08-06-2020

    and Last Date for registration: 18-06-2020

2. The webinar date: 08-June-2020 , Friday at 11:30 AM

3. The Total Number of Registrations: 213

4. The Total Number of participants : More than 112 are participated and 88 are given completed certificates as per feedback report obtained at the end.

5. The faculty members and research scholars from the following states (13 states), attended the webinar.

    i.   Andhra Pradesh
    ii.   Arunachal Pradesh
    iii.   Assam
    iv.   Bihar
    v.   Karnataka
    vi.   Kerala
    vii.   Madhya Pradesh
    viii.   Manipur
    ix.   Rajasthan
    x.   Tamil Nadu
    xi.   Telangana
    xii.   Uttar Pradesh
    xiii.   West Bengal

6. Materials on Machine learning and Deep learning using MATLAB and Instructions about webinar communicated through mails to all registered members.

2.8.   PANEL DISCUSSIONS

NA

2.9.   VALEDICTORY SESSION

NA

3. MAJOR TAKEAWAYS

3.1. ACADEMIC CONTEXT

It was increasingly feasible to create and sustain virtual networks using resources such as videoconferencing and web 2.0 communications, which allowed substantial value in bringing people together to be immersed in a common experience. Personal interactions also allow for informal communication outside the defined schedule that can be valuable to the network-building process.

A key element for ensuring success and enhancing sustainability in this webinar is the participation of teams from institutions, including a range of junior to senior members on each team. The adopted webinar model has shown added success and commitment by participants if their home institute provides at least modest resources to help implement what faculty learns.

3.2. RESEARCH CONTEXT

As the design of the planning committee meeting of Dept of Mathematics, RGU suggested, the webinar built around extensive, direct participation. Participants have the opportunity to be both "students" and "teachers," to practice the methods they are learning, and to develop "teachable tidbits" and other materials (e.g., appropriate assessments) to help them implement their research or modules at their innovation practices.

An important feature of this webinar's hands-on approach is the commitment to assist participants in implementing what they have learned. In addition to implementing new ideas or courses, they acquired experience and resources to plan and carry out effective assessments of whether the learning goals of their new activities are being met. Through this webinar participant academics from various universities discussed didactical approach of research in data science and get its benefits for their research.

3.3. POLICY MAKING AND PRACTICE CONTEXT

At this webinar, we will deliberate on some of the critical aspects of modern trends of advanced research tools in higher education. This webinar introduces the Machine

learning and Deep learning using MATLAB research product family and provides a high-level overview of the major capabilities. Webinar highlights include examples that demonstrate first-person modeling, modeling paradigms, and black box modeling with a special reference to Machine learning and Deep learning.

The resource person through video presentation explained how we can use deep learning modules for data exploration to invert the classroom and create a more active learning environment. It is also covered best practices on incorporating technical computing, modeling, and simulation with MATLAB in research based academic curricula.

3.4.   SUMMARY

Department of Mathematics, Rajiv Gandhi University organized a Free Webinar on "Machine learning and Deep learning using MATLAB" in association with Elmax Systems and Solutions, MathWorks (MATLAB and SIMULINK) and Department of Computer Sc. & Engg., Rajiv Gandhi University. Total 88 participants from various parts of the country successfully attended the program connecting through online mode from their home.

Prof. Saket Kushwaha, Hon'ble Vice-Chancellor congratulated the participants who completed the program and told that learning is a continuous process that promote teachers' teaching skills, master new knowledge, develop new proficiency, which in turn, help improve students' learning . He expressed that, the outbreak of COVID-19 pandemic in India has caused extreme distress to the society and is a setback to academic activity. In this moment of crisis, RGU has endeavored to leverage digital access for continuation of the academic activities by online mechanisms, he said. He appreciated the Department of Mathematics for organizing the program in an appropriate time. Prof. A. Mitra, Pro-Vice Chancellor stressed the importance of online platforms for learning during this pandemic. Prof. Tomo Riba, Registrar stressed that RGU always tries to provide the best and innovative learning environment to the participants, this time in an online mode.

All the participants expressed that they had wonderful learning experience during the webinar and conveyed their gratitude to the webinar Convener, Dr. Saifur Rahman and Dr. Firos A, Secretary. They said that the learning experience from this webinar would take them a long way in their academic prospects.

The webinar organized by RGU was meant for faculty and researchers. The webinar is specially designed to meet the modern education requirements of teachers, researchers, and trainers in HRD, training colleges and industrial organizations.

4. APPENDIXES & ANNEXURE

ANNEXURE 1: PROGRAM SCHEDULE

Webinar on

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1:10 pm - 1:30 pm	Discussion time
1:30 pm - 1:35 pm	Vote of Thanks by **Dr. Saifur Rahman**, convener

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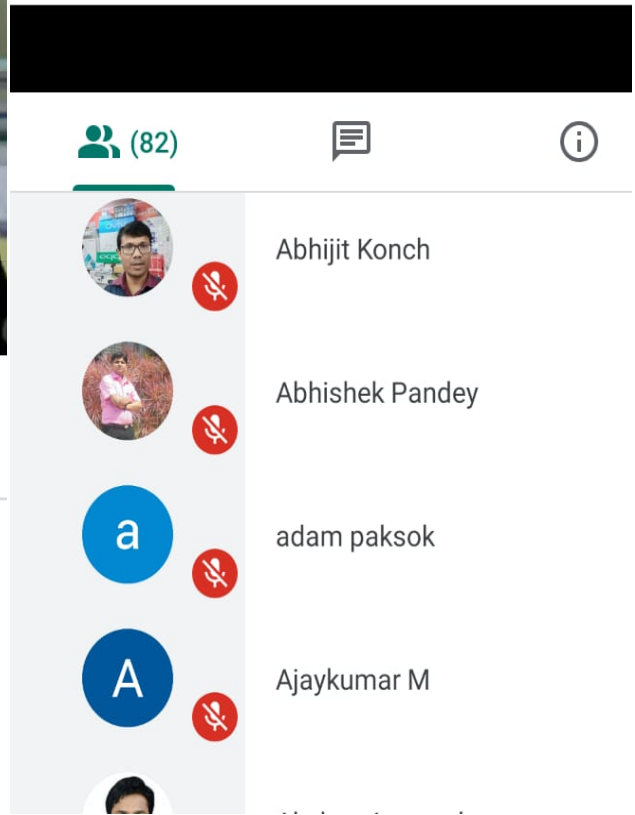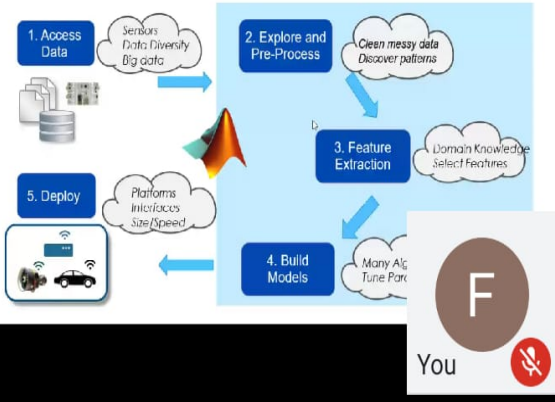|		
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ANNEXURE 3: PHOTOGRAPHS

● REC
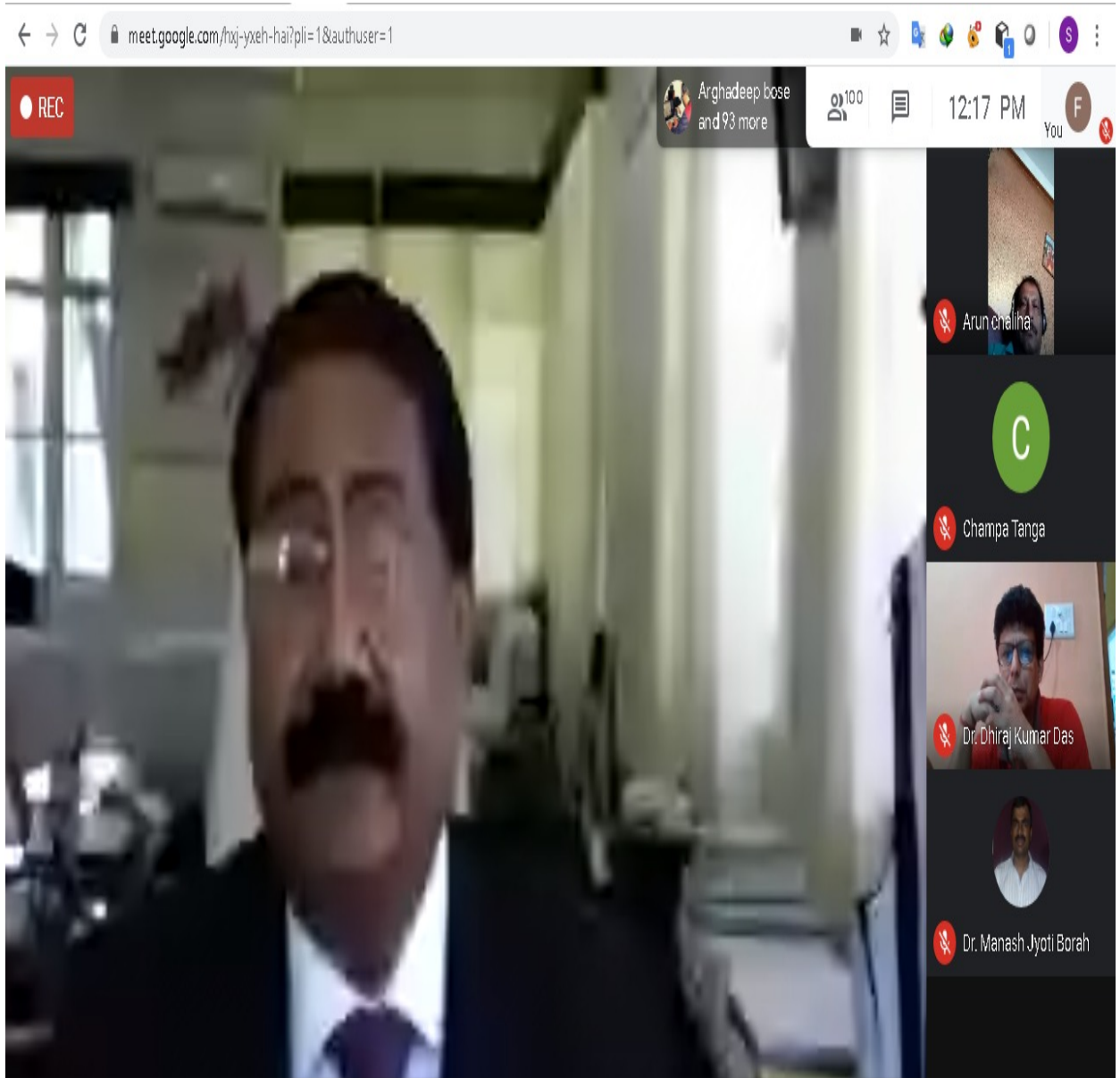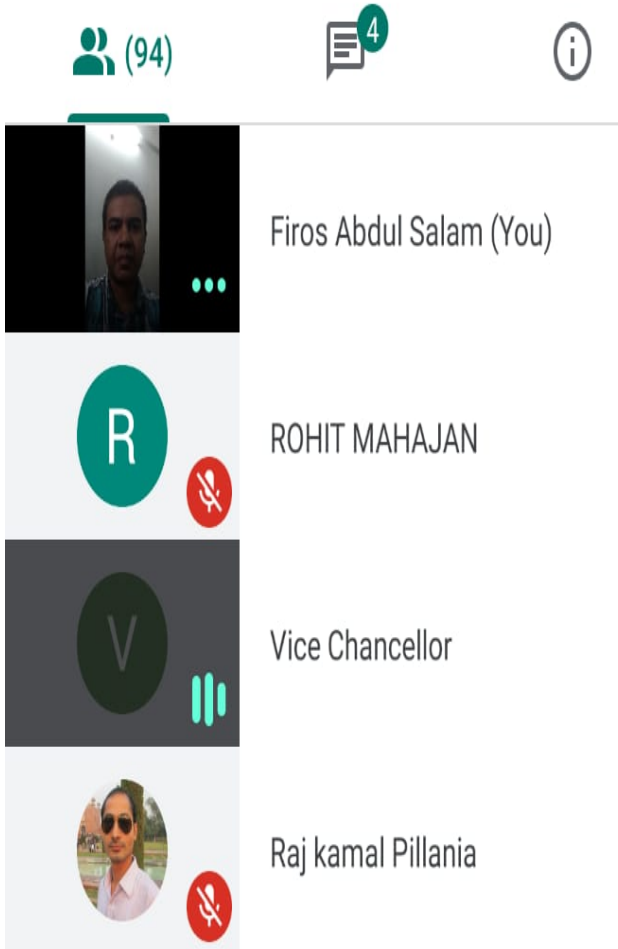
● REC
Clustering

· Segment data into groups based on similarity
· Identify outliers
· Discover patterns of interest
· Variety of algorithms
  · *k-means, k-medoids, Hierarchical, Gaussian Mixture Models, Nearest Neighbors, Hidden Markov Models, Fuzzy C Means*
· Iterative process

Clustered Data and Component Structures

Cluster 1
Cluster 2
Cluster 3

Petal width (cm)

Petal length (cm)

👥 (94)   💬 4   ⓘ

Firos Abdul Salam (You)

R   ROHIT MAHAJAN

V   Vice Chancellor

Raj kamal Pillania

👥 (82)   💬   ⓘ

Abhijit Konch

Abhishek Pandey

a   adam paksok

A   Ajaykumar M

Namrata Alamyayan Now
Informative sir

Sandeep Mithariya Now
Good sir

Priya Saxena Now
Its really gud

Rijo Riba Now
Yes sir it is informative

Send a message to everyone here

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Vol. 32   No. 15   SATURDAY, JUNE 20, 2020   ₹ 3

RGU conducts webinar using MATLAB

RONO HILLS, Jun 19: A webinar on machine learning and deep learning using MATLAB was organized by the mathematics department of Rajiv Gandhi University (RGU) from here on Friday, in association with Kolkata (WB)-based Elmax Systems and Solutions, MathWorks, and RGU's computer science & engineering department.

Altogether 213 faculty members and teachers from various parts of the country attended the webinar through Google Meet.

The webinar was designed to meet the requirement of modern education for teachers, researchers and trainers in HRD, training colleges and industrial organizations.

The participants were given learning resources to support their classroom instruction and their researches.

Webinar on AI concludes
Meanwhile, the university's two-day webinar on 'Recent trends in artificial intelligence' concluded on Friday. It was organized by RGU's electronic & communication and computer science & engineering department.

Basic Sciences Faculty Dean, Prof Sanjeev Kumar said that AI such as Siri and Alexa makes the people smarter in their daily life, and called for developing more efficient AI devices "which can help us in the field of medical sciences."

Electronics & Communi-

cation Head, Jagdeep Rahul described AI as the future of "virtually every industry and every human being."

Dr Vijay Kumar Bohat from Noida (UP)-based Bennet University spoke on the topic of 'Introduction to AI, machine learning and their real world applications in different fields to technology'.

Prof Vijay Kumar Nath from Tezpur University (Assam) deliberated on the topic of 'Some developments on local pattern-based texture descriptors for content-based image retrieval for future extraction'.

The webinar was attended by more than 100 participants from various universities and colleges in India and abroad.

Webinar on 'machine learning, deep learning using MATLAB'

RONO HILLS, Jun 19: A webinar on 'machine learning and deep learning using MATLAB' was today organized by Department of Mathematics, Rajiv Gandhi University in association with Elmax Systems and Solutions, Kolkata, MathWorks (MATLAB and SIMULINK) and Department of Computer Science & Engineering, RGU. More than 200 participants from various parts of the country attended the programme connecting through Google meet mode from their homes.

RGU Vice-Chancellor Prof Saket Kushwaha addressing the inaugural session told that learning is a continuous process that promotes teachers' teaching skills, master new knowledge, develops new proficiency, which in turn, helps improve students' learning.

Recourse person Debojit Sen not only covered basic idea about the MATLAB as a tool for machine learning and deep learning, which can play great role in almost all research areas but also focused on qualitative and quantitative research methods and innovative pedagogical techniques using SIMULINK.

The webinar was specially designed to meet the modern education requirements of teachers, researchers, and trainers in HRD, training colleges and industrial organizations. The participants were given the learning resources that will support their classroom instruction as well as in their research in future.

The participants also expressed that they had wonderful learning experience during the webinar and said that these 5 days experience would take them a long way in their academic prospects.

PAGE 2 — LOCAL / NORTH EAST / NATIONAL

RGU's eCBP on 'Disaster Risk Reduction' draws close

Bid to contain spread of COVID-19

Webinar on 'machine learning, deep learning using MATLAB'

NFR conducts general awareness program on COVID-19

2 NSCN(R) cadres...

ALS launches...

Child Friendly Corner...

ANYA destroys, boycotts...

NPP names Dr Khaduli district RS member from Meghalaya

Mr Seppa bandh...

Corona warriors equipped...

Sonowal reviews COVID status of Sivsagar district

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BREAKING NEWS   Tripura's COVID-19 tally rises to 1,264 with 23 fresh ca

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Webinar spree continues in RGU, focus on disaster risk reduction

POPULAR POSTS

Arunachal football team selection to begin Aug 28

August 24, 2016

Artist angry over 'false' advertisement for

ANNEXURE 5: BROCHURE

ABOUT THE WEBINAR

Are you a Researcher? Do you have a very basic understanding of MATLAB or Simulink? Do you want to learn new things from an expert? Department of Mathematics, Rajiv Gandhi University, Arunachal Pradesh organizes a webinar in association with Elmax Systems and Solutions, MathWorks (MATLAB and SIMULINK) and Department of Computer Sc. &Engg., Rajiv Gandhi University for spreading knowledge among the research enthusiasts & MATLAB Lovers! We are trying to build the next generation of technology developers and we look forward to your participation in the webinar and achieve the practical knowledge from MATLAB experts.

WHO CAN ATTEND THE PROGRAM?

Faculties, Research Scholars and PG Students

HOW TO APPLY

There is no registration fee. The registration is open till 18 June 2020, 05.00PM. Shortlisted participants will be communicated through registered email with programme schedule. Participation certificate will be provided to the attendees who fulfill the course criteria.

Click bellow link for Registration
https://forms.gle/wMfcDrQ9Wcpt9tsd7
Or use the QR code

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Webinar on

Machine learning and Deep learning using MATLAB

On 19th June 2020 @11:30 AM

Organised By:

**DEPARTMENT OF MATHEMATICS
RAJIV GANDHI UNIVERSITY
RONO HILLS, DOIMUKH-791112**

in association with

ELMAX SYSTEMS AND SOLUTIONS, MATHWORKS (MATLAB AND SIMULINK) AND DEPARTMENT OF COMPUTER SC. & ENGG., RGU

Duration: 1 hour 45 minutes