UIS –Division Mathematics

National Workshop on Mathematical tools for Research -Analysis

Name: Mathematical tools for Research Analysis

Brief description: Researchers rely heavily on data as they have a story to tell or problems to solve. It starts with a question, and data is nothing but an answer to that question. But, what if there is no question to ask? Research data analysis is a process used by researchers for reducing data to a story and interpreting it to derive insights. The data analysis process helps in reducing a large chunk of data into smaller fragments, which makes sense. The renowned experts will help audience and students to identify the right tools to be used for research.

National Workshop on **'Mathematical tools for Research analysis '** is being organized as a part of **TechInvent-2021**, by the Division Mathematics(UIS). This workshop will provide a platform for knowledge sharing and learning to the entire stakeholder fraternity in the field of Mathematics and moreover Data Science. The objective of mathematical tools is in its ability to make user able to analyze industry, education, and other fields related to research. This workshop creates a path to understand the concept and implication of various mathematical tools in context of different research key areas and apply the principles of both in a real-time scenario.

Objectives

This workshop will help students, academicians and researchers to develop an understanding on latest mathematical tools and its application in the field of research.

The real-world use cases of these mathematical tools to analyze real datasets.

Make the participants aware about the exciting opportunities that these tools create in the fields of research and studies.

Make students aware how different tools has been impacting the people working in the respective fields.

To enable students and other participants with technical skills for selecting appropriate tool according to the problem definition, they are working on.

Course outcomes:

After attending workshop, the participant would have clear understanding of following parts of research practices and issues.

Need of mathematical tools in research

Features of Different Mathematical tools used in key research areas

Role of Mathematical tools used in research : Challenges and Approaches

Emerging mathematical tools

Technology and post pandemic economy's effect on research

Enhancing research value by using appropriate tool

Licensing and other monetary requirements for using mathematical tools

Hindrance of research due to unavailability of these tools for free

Benefits of Workshop

The workshop would enhance the research inquisitiveness of the participants. Attendees of the workshop will be able to use the acquired knowledge in following domains:

Research in course curriculum (i.e, knowledge of proper tool to be used in academic field like Ph.D)

Shareable knowledge with students by the attending faculty members, that in turn will improve the quality of learning in the institute

It is intended to enhance research value by using appropriate tool

Students and participants would get basic operational knowledge of the research analysis tools for free.

Experts vast knowledge will help participants widen their horizon of the awareness.

Names Proposed from Academics		
S. No.	Names	Profile
1.	Prof.(Dr.) J. C. Bansal	Dr. Jagdish Chand Bansal is an Associate Professor at South Asian University New Delhi and Visiting Faculty at Maths and Computer Science, Liverpool Hope University UK. Dr. Bansal has obtained his Ph.D. in Mathematics from IIT Roorkee. Before joining SAU New Delhi he has worked as an Assistant Professor at ABV- Indian Institute of Information Technology and Management Gwalior and

		BITS Pilani. His Primary area of interest is Swarm Intelligence and Nature Inspired Optimization Techniques. Recently, he proposed a fission-fusion social structure based optimization algorithm, Spider Monkey Optimization (SMO), which is being applied to various problems from the engineering domain. He has published more than 60 research papers in various international journals/conferences. He is the series editor of the book series Algorithms for Intelligent Systems (AIS) and Studies in Autonomic, Data-driven and Industrial Computing (SADIC) published by Springer. He is the editor in chief of International Journal of Swarm Intelligence (IJSI) published by Inderscience. He is also the Associate Editor of IEEE ACESSS published by IEEE and ARRAY published by Elsevier. He is the steering committee member and the general chair of the annual conference series SocProS. He is the general secretary of the Soft Computing Research Society (SCRS). He has also received Gold Medal at UG and PG level.
2.	**Dr. Amreek Singh**	Organization: Snow & Avalanche Study Estt (SASE), Defence Res & Dev Orgn (DRDO) Qualification: PhD (Mathematics) Scrs Membership: Life Member 33 Publications on researchgate. **Skills and Expertise** Optimization Methods Classification Algorithms Evolutionary Computation Soft Computing Predictive Modeling Machine Learning Neural Networks and Artificial Intelligence Data Mining and Knowledge Discovery Statistical Data Analysis Swarm Intelligence
3.	**Dr.Arvind Gupta**	Dr. Gupta is working as an Associate Professor in the Department of Mathematics, IIT Ropar. After obtaining his Master and Doctoral degree from IIT Roorkee, he joined BITS Pilani in 2006 as an Assistant Professor in the Mathematics Group and later in 2010 joined Department of Mathematics, IIT Ropar. Dr. Gupta's areas of research interests include Mathematical Modeling of Traffic flow, Asymmetric simple exclusion process, Lattice hydrodynamics and Cellular Automata. Areas of Research:

		Mathematical Modeling Driven Diffusive Systems Lattice Hydrodynamics
4.	**Dr.Himani Saini**	Currently working as a Scientist in Indian Space Research Organisation Bangalore. Completed masters in Industrial Mathematics and Informatics from Indian Institute of Roorkee and PhD from the same Institute after qualifying UGC-NET

		Experience ● Research Associate in the Department of Mathematics at IIT Bombay from April 2008 to August 2008 ● Sep 2008 to April 2011, Assistant professor, BITS, Pilnai-K.K. Birla Goa Campus, Goa. **Research Work / Area** ● Computational Partial Differential Equations ● Finite Volume Element Methods ● Finite Element Methods ● Discontinuous Galerkin Methods.
5.	**Dr.Sarvesh Kumar**	

The event will consist of:

- Expert lectures of renowned personalities from academia.
- The dedicated 2hrs sessions for the registered participants (UG/PG students, researchers, faculty)
- Participation certificates as a token of appreciation to the Participants.

Schedule:

Particulars	Date	Duration
Registration begins via Google form	July 2021	Upto Conduct of Event
Registration details through email to participants	July 2021	25th August
Workshop	31st August 2021 - 4th Sept 2021	5 Day
Feedback Form submission	Sept 2021	After the Workshop

E certificates Distribution	Sept 2021	Within one week of conduct of Workshop

Certificate of participation to all participants of National Workshop on Mathematical tools for Research Analysis from CU, Tech-Invent Team

Rules and regulations:

1) Registration for the workshop shall be open to all ,free of cost and shall be on first come first serve basis up to the number of participants that the virtual platform can accommodate. Google form shall be closed for responses once enough participants have registered.

2) Participants registering for the workshop will be provided with workshop related details through the registered email id.

3) All the participants of the workshop will receive a feedback form link. Participants filling feedback form will be sent e-certificates through Tech-Invent team,CU.

Operational Plan:

1) Google form will be floated for registration for Workshop
2) Participants registering for the workshop will be provided with workshop related details through the registered email id.
3) After each session ,participant will need to fill out Feedback form
4) Based upon feedback forms e-certificates would be generated by the team.

Mode of Workshop

To keep in mind the pandemic situation the workshop will be conducted through virtual mode ensuring the safety of each participant.

Participant Tracking:

1) Participants shall be tracked via Google form for registration
2) Participants attending online workshop sessions will be tracked by feedback form entries.
3) Participants attending all the sessions will be eligible for e-certificates.

Faculty Coordinators

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Student Coordinators

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