Department of Computer Science & Engineering and Information Technology

Jaypee Institute of Information Technology, Noida

(Deemed to be University under Section 3 of UGC Act 1956)

E D I T O R S : ● Prof. Charu ● Dr. Mukesh Saraswat ● Dr. Himani Bansal ● Dr. Pulkit Mehndiratta ● Dr. Vikash

Inside

Pro-Chancellor's Message

I am happy to know that the Department of CSE & IT is publishing its second volume of the newsletter "**i-Aabhyantar**". Like previous volume, I believe that "**i-Aabhyantar**" will showcase the various activities of the Department in the areas of teaching, research, placements, conferences, workshops, training programs, expert lectures and collaborations. In present time, computer science and IT is one of the fastest growing technology field. Modern society infrastructures and functions are mostly based upon IT. It is playing an important role in our daily live. At JIIT we aim to motivate and nurture our students to excel in multifaceted computing and IT technologies. I would like to congratulate the editorial team for bringing out this volume.

Prof. S. C. Saxena, Pro-Chancellor, JIIT, Noida

Vice-Chancellor's Message

I am happy to know that the Department of Computer Science & Engineering and Information Technology (CSE&IT) of Jaypee Institute of Information Technology (JIIT) Noida is bringing out their second volume of the Newsletter "*i-Aabhyantar*". The department strives to create an environment encouraging students to learn more and provide an auxiliary system to support extra-curricular participation. The Newsletter is a testimony to all the quality teaching and research happening in the Department. I look forward to reading about the various activities and achievements in the Newsletter.

Prof. Y. R. Sood, Vice Chancellor, JIIT, Noida

Head of the Department's Message

I am delighted and excited to present you the second issue of '*i-Aabhyantar*', the newsletter of CSE&IT Department, at Jaypee Institute of Information Technology (JIIT), Noida. It's a matter of pride and satisfaction that the department, with 100 faculty members and 130 Ph.D scholars, is successful in achieving the prime goal of a university to create and disseminate the knowledge. This newsletter is a small step to display various activities, academic achievements & success stories of our students and faculty. I strongly believe that '*i-Aabhyantar*', will provide another platform for our students and stakeholders to get enlightened and participate in the growth of the department. I am very thankful to Prof. Charu and editorial team members, Dr. Mukesh Saraswat, Dr. Himani Bansal, Dr. Pulkit and Dr. Vikash, who worked very hard to generate this newsletter.

Prof. Vikas Saxena, Head (CSE&IT), JIIT, Noida

i-Aabhyantar

Department of Computer Science & Engineering and Information Technology (CSE & IT) is blessed to introduce the second volume of the departmental newsletter "*i-Aabhyantar*". This version of the newsletter narrates the departmental permanence from January 2022 to June 2022.

India is recovering from the pandemic situation and is setting up the new normal situation for industry as well as for academics. Indian government plays an important role in launching **#IndiaFightsCorona** vaccination campaign, which has been boosted on the occasion of **Azadi Ka Amrit Mahotsav**. Nowadays, we can say that we are approaching towards the prevalent situation.

Under the supervision of Founder Chairman, Shri Jaiprakash Gaur, Hon'ble Chancellor, Shri Manoj Gaur followed by Hon'ble Pro-Chancellor, S. C. Saxena, and Hon'ble Vice-Chancellor, Prof. Y. S. Sood, CSE & IT department has established new ventures by following the vision and mission of JIIT.

JIIT is growing up with new innovated ways in higher studies to establish research & development environment for a sustainable growth. Apart from it, CSE & IT excels the limits of students by pushing up the coding culture for JIIT students. "*i-Aabhyantar*" is the common platform to publish major achievements in the form of statements and statics.

CSE & IT is always known for its tremendous efforts in the exponential growth of the institute. On the behalf of whole CSE & IT family, we would like to present the "*i-Aabhyantar*" dedicated to LORD SARASWATI.

With Best Regards

Editors

Vision and Mission of Institute

Vision

To become a Centre of Excellence in the field of IT & related emerging areas education, training and research comparable to the best in the world for producing professionals who shall be leaders in innovation, entrepreneurship, creativity and management.

Mission

1. To develop as a benchmark University in emerging technologies.

2. To provide state-of-the-art teaching learning process and R&D environment.

3. To harness human capital for sustainable competitive edge and social relevance.

Vision and Mission of CSE&IT Department

Vision

To be a Centre of Excellence for providing quality education and carrying out cutting edge research to develop future leaders in all aspects of computing, IT and entrepreneurship.

Mission

1. To offer academic programme with state-of-the-art curriculum having flexibility for accommodating the latest developments in areas of computer science and IT.

2. To conduct research and development activities in contemporary and emerging areas of Computer Science & Engineering and IT.

3. To inculcate IT & entrepreneurial skills to produce professionals capable of providing socially relevant and sustainable solutions.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS) OF B.TECH. (CSE)

PEO 1: To provide core theoretical and practical knowledge in the domain of Computer Science & Engineering for leading successful career in industries, pursuing higher studies or entrepreneurial endeavours.

PEO 2: To develop the ability to critically think, analyze and make decisions for offering techno-commercially feasible and socially acceptable solutions to real life problems in the areas of computing.

PEO 3: To imbibe lifelong learning, professional and ethical attitude for embracing global challenges and make positive impact on environment and society.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS) OF B.TECH. (IT)

PEO 1: To impart core theoretical and practical knowledge of Computer Science & Engineering and emerging Information Technologies for leading successful career in industries, pursuing higher studies or entrepreneurial endeavours.

PEO 2: To develop the ability to critically think, analyze, design and develop IT based solutions.

PEO 3: To imbibe the life-long learning and understanding of ethical values, their duties toward environmental issues and sensitize them toward their social responsibility as IT professional.

Recognitions

The CSE & IT Department is devoted to continuous development. With this motive, our faculty members and students continuously participate in various conferences and innovative challenges. Some of the major achievements are mentioned below.

- Fellowship granted to Ms. Ishita Gupta and Ms. Janani Pradeep of INR 60,000 in Technology Innovation Hub Foundation for IoT and IoE CHANAKYA Graduate Internship program. Dr. Suma Dawn is the faculty mentor.

- Dr. Payal Khurana Batra elevated as primary evaluator for Toycathon organized by the Ministry of Education's Innovation Cell, Ministry of Information and Broadcasting, Ministry of MSME, Ministry of Women and Child Development, Ministry of Commerce and Industry and Ministry of Textile, Government of India.

- Kritika Rani elevated as primary evaluator for Toycathon organized by the Ministry of Education's Innovation Cell, Ministry of Information and Broadcasting, Ministry of MSME, Ministry of Women and Child Development, Ministry of Commerce and Industry and Ministry of Textile, Government of India.

- Karan Bamal elevated with coding award entitled, "VAJRA" organized by Manthan, Ministry of Education, Government of India, Ministry of Innovation cell.

- Dr. Neetu Sardana won the best paper award for the paper titled, " Role of Popularity and Recency for discovery od experts in Stack Exchange Software Engineering Q&A website" organized by Institute of Engineering and Technology, a constituent college of Dr. APJ Abdul Kalam Technical University, Lucknow, India in association with University of Calabria, Italy.

Ph.D Awarded

❖ **Ms. Meenal Jain**
  ➢ Title - Application of Concept Drift and Distributed Machine Learning for Detection of Anomalies in Network Traffic
  ➢ Awarded on – 22th February 2022

❖ **Ms. Somya Jain**
  ➢ Title - Influential Nodes Identification for Online Social Networks
  ➢ Awarded on – 12th April 2022

❖ **Ms. Meeta Gupta**
  ➢ Title - Efficient Data Oriented Techniques in Wireless Sensor Networks
  ➢ Awarded on – 30th April 2022

❖ **Ms. Neetika Jain**
  ➢ Title - Computational Models for Safe and Fuel-Economical Assisted Driving using on-Board Sensors
  ➢ Awarded on – 06th May 2022

❖ **Ms. Madhuri Gupta**
  ➢ Title - A Computer Assisted Gene Expression Test Method for Early Prediction of Breast Cancer using Machine Learning Techniques
  ➢ Awarded on – 06th May 2022

❖ **Ms. Munaza Ramzan**
  ➢ Title - Electroencephalography Signal based Effective Elicitation of Emotions for Brain Computer Interfacing using Computational Techniques
  ➢ Awarded on – 14th May 2022

❖ **Mr. Himanshu Agrawal**
  ➢ Title - Decentralized Learning for Opportunistic Spectrum Access in Cognitive Networks
  ➢ Awarded on – 07th June 2022

Academic Events

Department of CSE & IT organizes various Conferences, Workshops, Faculty Development Programs, Seminars, Expert Talks, and Student Enrichment Programs. A large number of participations from academia and industries from all over the globe has been observed in these state-of-the-art events. Every year since 2008, the department organizes an annual International Conference on Contemporary Computing (IC3) with an objective of providing a forum to scientists and researchers, to discuss and put forward their ideas and research findings with the co-researchers from all over the world. This Conference is jointly organized by the Jaypee Institute of Information Technology, Noida, India and University of Florida, Gainesville, USA. Moreover, Department of CSE & IT is going to organize International Conference on Informatics (ICI), which aims to provide a leading international forum for researchers, scientists, and industry professionals who are working on next generation informatics. Despite the COVID-19 pandemic for last more than two years, the CSE&IT Department has organized a number of online events for the enrichment of faculty and students. The details of such events, held online between January-June 2022, are mentioned below.

- ❖ Workshop on "Entrepreneurship Skill, Attitude and Behavior", on 12th February 2022.

- ❖ Workshop on "Problem Solving and Ideation" on 26th February 2022.

- ❖ Expert session entitled, "What IT industry can expect in next decade" delivered by Mr. Jugal Agarwal on 24th March 2022.

- ❖ Summer hackthon entitled, "Hackin Summer,22", organized on 07th April 2022.

- ❖ First International Conference on Informatics organized on 17-16th April 2022.

- ❖ Invited Talk entitled, "Recent Trends in Cybercrime" delivered by Dr. Anup Girdhar on 20th May 2022.

Workshop on Entrepreneurship Skill, Attitude and Behavior Development

Speaker: Mr. Kamal Kumar Patel, Founder and Director, Gusto Drift Pvt. Ltd., Noida

Date: 12th February, 2022

Objective: To create awareness amongst students of B Tech and M Tech on how an entrepreneurship idea is to be developed.
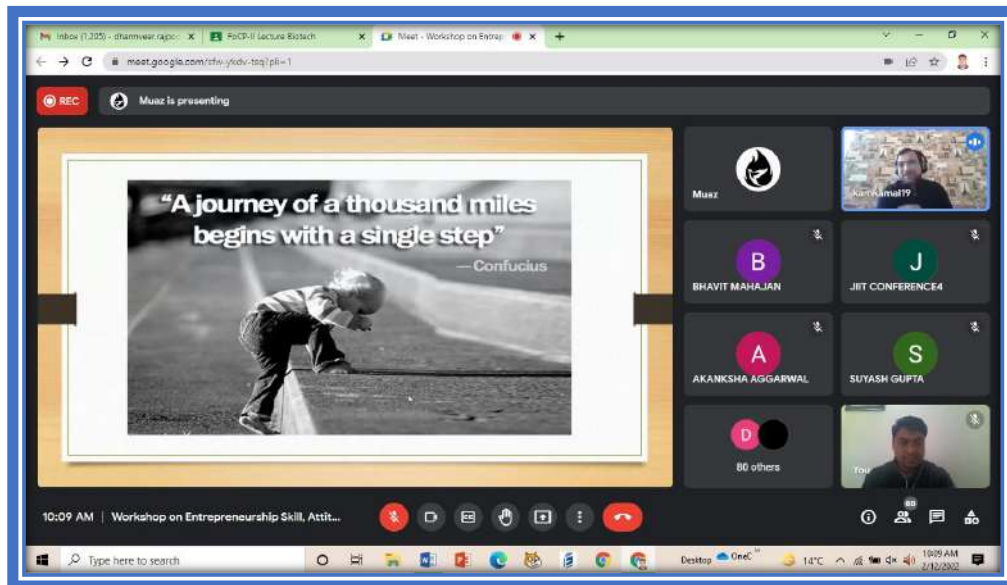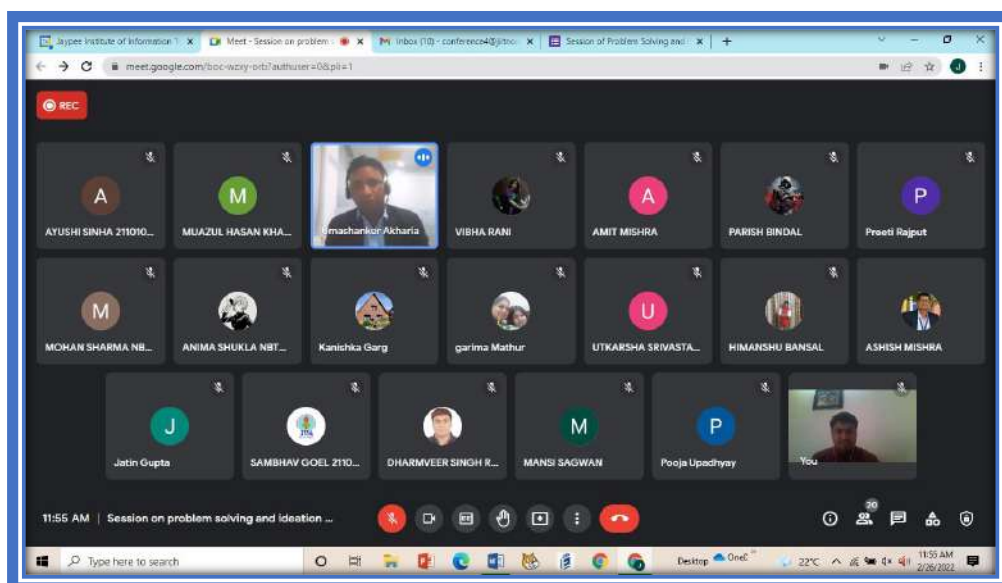

Workshop on Problem Solving and Ideation

Speaker: Mr. Umashanker Akharia, Co-Founder and CEO of StartupJob.in

Date: 26th February, 2022

Objective: To create awareness amongst students of B Tech and M Tech on how an innovative idea is to be conceptualized.

Invited Talk on What IT industry can expect in next decade?

Speaker: Mr. Jugal Agrawal, Vice President, Natwest Group

Date: 24th March, 2022

Objective: The objective of the expert talk was to make faculty members and students familiar with the current trends of the IT industries and what IT industries can expect in next one decade from the IT professionals and academia.
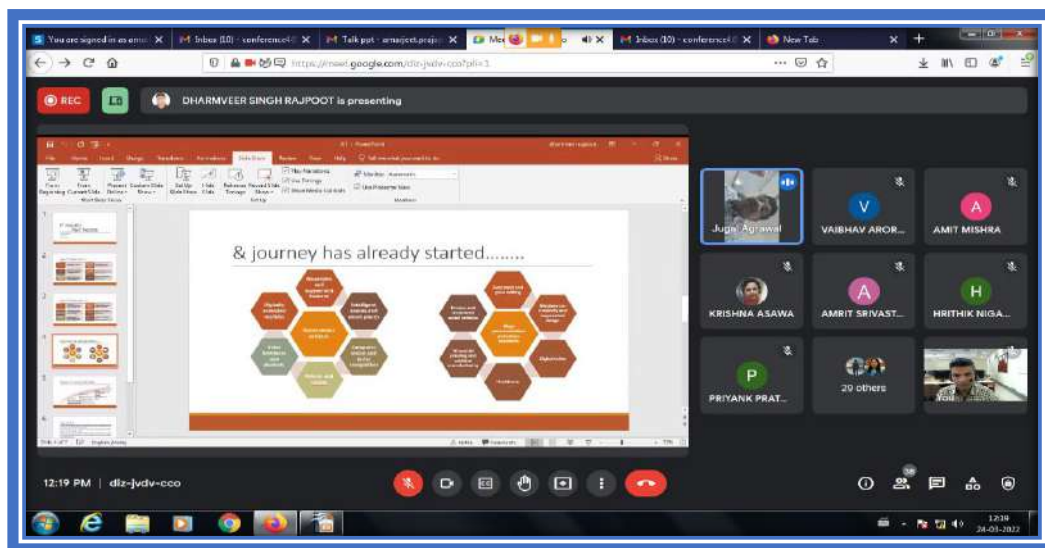
Invited Talk on Recent Trends in Cybercrime

Speaker: Dr. Anup GIrdhar, CEO-Founder, Sedulity Solutions & Technologies

Date: 20th May, 2022

With reference to the circular released by UGC, New Delhi to the Universities, the Department of CSE & IT at JIIT, Noida organized talk on **"Cyber Security Awareness"** for the faculty members and students of JIIT.

Hackin' Summer '22 (Hackathon)

Date: 07-10th April, 2022

Internal hackathon was organized with the objective to provide a platform to the students for solving the varied trivial problems that we face in our daily lives. Such events help in inculcating a culture of product innovation and a mindset of problem-solving. These events also help in assessing the abilities of students to understand the different situations and problems and how to tackle them in an efficient way, work in team and leadership quality. The event was extremely successful in promoting innovation out-of-the-box thinking in young minds, especially, engineering students from across India. The prime benefit of the event was inculcating the habit of creative thinking, solving the same problem in a different way, and coming up with innovating ideas. The students realized their abilities to work in team, lead the team, work under stress, meeting deadlines etc. They also learned to identify the strengths, utility, suitability and limitations of their products and applications in different scenarios.

First International Conference on Informatics (ICI)

First International Conference on Informatics (ICI) aims to provide a leading international forum for researchers, scientists, and industry professionals who are working on next generation informatics. ICI-2022 is organized under the leadership and joint vision of the Department of CSE & IT, JIIT, Noida (outskirt of Delhi, India) & Prof. Sartaj Sahni, University of Florida, USA.

This edition of conference had 4 keynote talks from
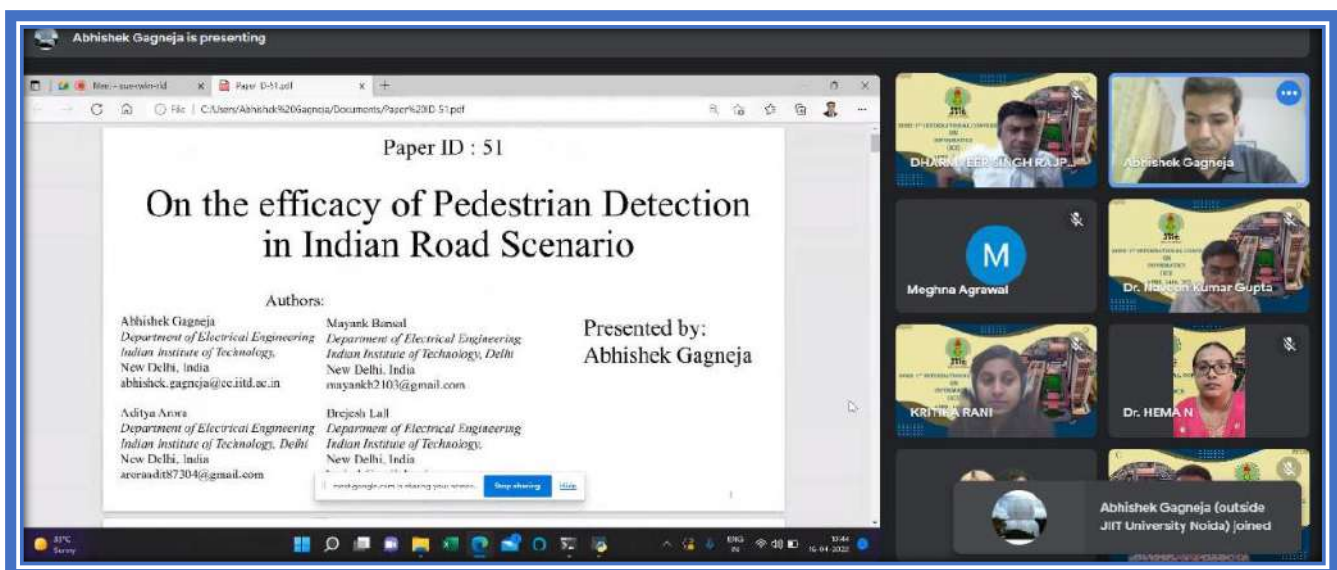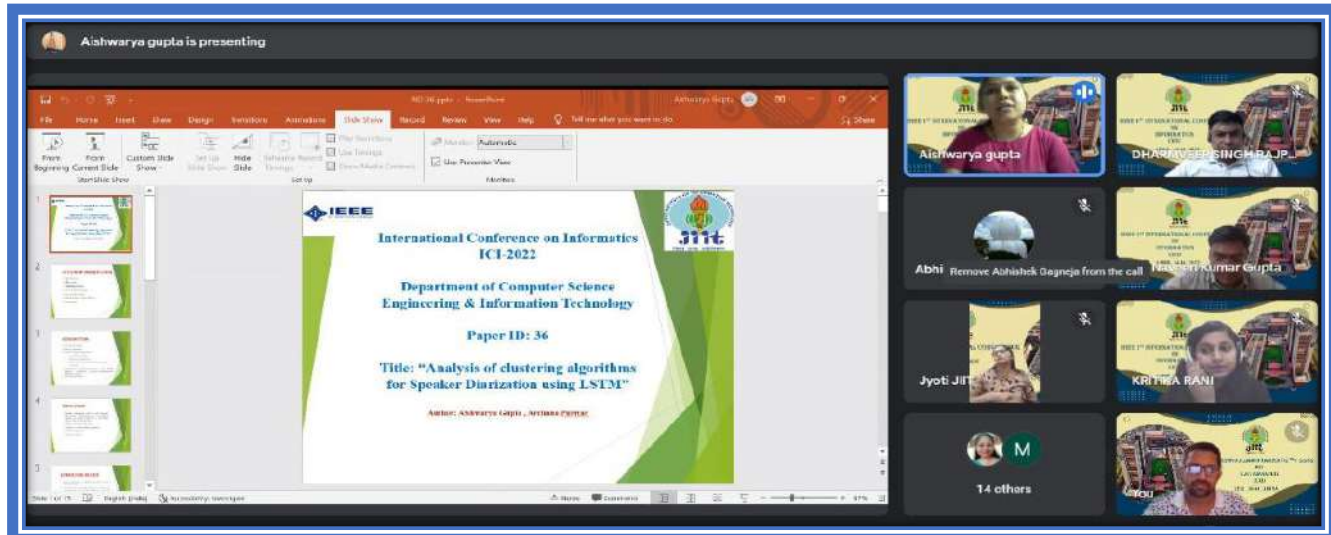
1. Prof. CV Jawahar, IIITH
2. Prof. Sanguthevar Rajasekaran, University of Connecticut, USA
3. Prof. Sanjay Ranka, University of Florida, USA
4. Prof. Sudip Misra, IIT Kharagpur, India

ICI-2022 had around 50 papers from various countries in the emerging areas (not limited to only these) of Big Data, AI & Machine learning, Blockchain and Cloud Technology, IOT and smart systems.

GUEST LECTURES BY JIIT FACULTY

➢ Dr. Payal Khurana Batra was invited as resource person in FDP on Problem Solving and Programming using Python held from 29th June 2022 to 06th July 2022, organized by the department of School of Sciences, Christ University, Ghaziabad.

➢ Dr. Pulkit Mehndiratta was invited as resource person in one week workshop on Machine Learning and Artificial Intelligence at CPJ College of Higher Education from 13th – 20th April 2022, Narela Delhi.

➢ Dr. Pulkit Mehndiratta was the resource person at two days workshop on Machine Learning from 22nd-23rd May 2022 at DAV School, Sector-49, Gurugram.

Placement Highlights

Placement Status: B.Tech-CSE-IT-2023 Graduating Batch						
Sr No	Year	Eligible Participating Students	Total Offers	% of Total Offers	Absolute Offers	% of Absolute Offers
BTech CSE						
1	2023*	472	553	117%	403	85%
BTech IT						
2	2023*	48	54	113%	44	92%

Top Five Companies according To Package Offered		
Sr No	Company Name	Package (Lacs)
1	Atlassian	57.28
2	Adobe	55.38
3	Microsoft	51.03
4	Google India	50.44
5	Pure Storage	48.25

Top Five Companies according to Number of Students Placed		
Sr No	Company Name	No. of Students Placed
1	Cognizant	72
2	Accenture	53
3	Reliance Jio	32
4	Thales Group	27
5	Oracle FSS	26

Research Accomplishments

International Journals

- ❖ Gujral, H., Sharma, A., Jain, P. Juneja S, Mittal S. Design and Implementation of a Quantitative Network Health Monitoring and Recovery System. Wireless Pers Commun 125, 367-397 (2022).

- ❖ Rachit Shukla, Adwitiya Sinha, Ankit Chaudhary. TweezBot: An AI-Driven Online Media Bot Identification Algorithm for Twitter Social Networks. Electronics, vol. 11, no. 5: 743, pp. 1-21, 2022.

- ❖ Dutta, P. Agarwal, A. Mittal, and S. Khandelwal. Detecting grades of diabetic retinopathy by extraction of retinal lesions using digital fundus images. Research on Biomedical Engineering, no. 0123456789, 2021.

- ❖ Paul N, Bhatt AJ, Rizvi S. Malware Detection in Android Apps Using Static Analysis. Journal of Cases on Information Technology (JCIT). 2022;24(3):1-25.

- ❖ Rathi, M., Sahu, S., Goel, A., & Gupta, P. (2022). Personalized Health Framework for Visually Impaired. Informatica, 46(1).

- ❖ Mayuri Gupta, Adwitiya Sinha. Multi-Class Autoencoder-Ensembled Prediction Model for Detection of COVID-19 Severity. Evolutionary Intelligence, Springer, pp. 1-11, 2022

- ❖ Deepanshi, Adwitiya Sinha. Self-Aware Contextual Behavior Analysis for Service Quality Assurance over Social Networks. Journal of Cases on Information Technology, IGI Global, pp. 1-17, 2022.

- ❖ Parmeet Kaur, Sanya Deshmukh, Pranjal Apoorva, and Simar Batra. Analysis and Outcome Prediction of Crowdfunding Campaigns. International Journal of Information Retrieval Research (IJIRR) 12, no. 1 (2022): 1-14.

International Conferences

❖ S. S. Bisht and P. Kaur. An Empirical Investigation of a Fault Tolerant Containerized Application Deployment. 1st International Conference on Informatics (ICI), 2022, pp. 171-175.

❖ B. Saxena, A. Arora, M. Gupta, P. Mittal and J. Singh. Features Driven Brain Tumor Detection Using Machine Learning Models. 2022 1st International Conference on Informatics (ICI), 2022, pp. 53-59.

❖ Misha Rana, Nimesh kumar, Himanshi Sharma, Kavita pandey. Effect of Hyper-Parameter Tuning on the Performance of Augmented Random Search. Proceedings of 2022 1st International Conference on Informatics (ICI), April 14-16, Noida, India. pp. 47-52

❖ A. Purwar, H. Sharma, Y. Sharma, H. Gupta and A. Kaur. Accent classification using Machine learning and Deep Learning Models. 2022 1st International Conference on Informatics (ICI), 2022, pp. 13-18.

❖ D. Singh, L. Kumar, S. Jain and S. Garg. Analyzing Diffusion Process in Signed Networks. 2022 1st International Conference on Informatics (ICI), 2022, pp. 148-152.

❖ M. Zaid and P. Agarwal. Intelligent Intrusion Detection System Optimized using Nature-Inspired Algorithms. vol. 128, no. ICI, pp. 80–85, 2022.

❖ Shukla, Prabhat, Shashank Thakur, Shriti Arora, and Ankita Wadhwa. Nature-Inspired Algorithms Analysis on various Benchmark Functions using Python and Golang. In 2022 1st International Conference on Informatics (ICI), pp. 226-228. IEEE, 2022.

❖ Kumar, N., & Dawn, S. River Course Change Detection using Remote Sensing Imaging. In 2022 1st International Conference on Informatics (ICI) (pp. 108-113). IEEE.

❖ Y. Choudhary, A. Agarwal. Detecting drivers drowsiness using haar cascade classifier. IEEE, 3 2022. pp. 318"322.

❖ Abhishek, Abhishek Singh Rathore, Arnav Saxena, Adwitiya Sinha. Intelligent Visual Interface for Assisted Digital Teaching Using Computer Vision. IEEE International Conference on Informatics (ICI), 14-16, 2022.

International Conferences

❖ A. Chandak, A. Singh, S. Mishra and S. Gupta. Virtual Bazar-An Interactive Virtual Reality Store to Support Healthier Food Choices. 2022 1st International Conference on Informatics (ICI), 2022, pp. 137-142.

❖ Vimal Kumar, K., Ahuja, S., Choudary, S., Parwekar, P. (2022). Incorporating Contextual Information in Prediction Based Word Embedding Models. In: Rathore, V.S., Sharma, S.C., Tavares, J.M.R., Moreira, C., Surendiran, B. (eds) Rising Threats in Expert Applications and Solutions. Lecture Notes in Networks and Systems, vol 434. Springer, Singapore.

❖ Gupta, Sarthak, Akshara Agarwal, Paluck Deep, Saurabh Vaish, and Archana Purwar. Analysis of Minimum Support Price Prediction for Indian Crops Using Machine Learning and Numerical Methods. In International Conference on Innovative Computing and Communications, pp. 267-277. Springer, Singapore, 2022.

Book Chapters

❖ Puri, Vartika, Parmeet Kaur, and Shelly Sachdeva. Efficient Clustering of Transactional Data for Privacy-Preserving Data Publishing. In Cyber Security and Digital Forensics, pp. 153-160. Springer, Singapore, 2022.

❖ Rawat, Tara, and Shikha Jain. Depression detection: approaches, challenges and future directions. Artificial Intelligence, Machine Learning, and Mental Health in Pandemics. Academic Press, 2022. 209-234.

❖ Sood, Rishik, Hrishav Varma, Kavita Pandey, Shikha Jain, Degala Sriram, and Arshpreet Singh Guglani. Predicting loneliness from social media text using machine learning techniques. Artificial Intelligence, Machine Learning, and Mental Health in Pandemics. Academic Press, 2022. 259-275

❖ Bisht, Sankalp Singh, Herumb Shandilya, Vaibhav Gupta, Shriyansh Agrawal, and Shikha Jain. Perceiving the level of depression from web text. Artificial Intelligence, Machine Learning, and Mental Health in Pandemics. Academic Press, 2022. 277-298.

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- Rishik Sood and Hrishav Varma and Kavita Pandey and Shikha Jain and Degala Sriram and Arshpreet Singh Guglani, Chapter Eleven - Predicting loneliness from social media text using machine learning techniques, in book titled as Artificial Intelligence, Machine Learning, and Mental Health in Pandemics, Academic Press, Elsevier, May, 2022, pp. 259-275

- Paras Chaudhary, Adwitiya Sinha, and Somya Jain. Sustainable Computing An Overview. Advanced Computational Techniques for Sustainable Computing (2022): 1-19.

- Sherry Garg, and Rajalakshmi Krishnamurthi. Smart Health Analytics for Sustainable Energy Monitoring Using IoT Data Analytics. In Advanced Computational Techniques for Sustainable Computing, pp. 107-121. Chapman and Hall/CRC, 2022

- S. M. Anirban Dutta, Parul Agarwal, Anushka Mittal, Shishir Khandelwal, Detection of Diabetic Retinopathy Using Ensemble Learning Techniques - Fundamentals and Methods of Machine and Deep Learning - Wiley Online Library, in Fundamentals and Methods of Machine and Deep Learning: Algorithms, Tools and Applications, 2022, pp. 153-175.

- Saraswat, M., Sharma, H. and Arya, K.V., 2022. Intelligent Vision in Healthcare. In Intelligent Vision in Healthcare (pp. 1-8). Springer, Singapore.

- Saraswat, M., Sharma, H. and Arya, K.V., 2022. Intelligent Vision in Healthcare. Springer, Singapore.

- V Puri, P Kaur, S Sachdeva, Efficient Clustering of Transactional Data for Privacy-Preserving Data Publishing, In book: Cyber Security and Digital Forensics (pp.153-160) , 2022

- Dutta, A., Mittal, A., Khandelwal, S., & Sinha, A. (2022). Assessing Land Cover and Drought Prediction for Sustainable Agriculture. In Advanced Computational Techniques for Sustainable Computing (pp. 33-51). Chapman and Hall/CRC

- Miglani, P., Bhandari, J., Alreja, U., & Sinha, A. (2022). Electronic Health Record for Sustainable eHealth. In Advanced Computational Techniques for Sustainable Computing (pp. 53-67). Chapman and Hall/CRC.

- Agarwal, M., Parashar, P., Mathur, A., & Sinha, A. (2022). Customer Analytics for Purchasing Behavior Prediction. In Advanced Computational Techniques for Sustainable Computing (pp. 123-137). Chapman and Hall/CRC

Book Chapters

❖ Puri, R., Bhandari, J., Gupta, R., & Sinha, A. (2022). Time Series Analysis and Trend Exploration of Stock Market. In Advanced Computational Techniques for Sustainable Computing (pp. 197-212). Chapman and Hall/CRC

❖ Saini, S., Tripathi, V., Tyagi, K., & Sinha, A. (2022). Assessing Impact of Global Terrorism Using Time Series Analysis. In Advanced Computational Techniques for Sustainable Computing (pp. 225-244). Chapman and Hall/CRC

❖ Gupta, A., Chahal, E. S., Haritosh, A., Sinha, A., & Chandra, S. (2022). Sports Analytics for Classifying Player Actions in Basketball Games. In Advanced Computational Techniques for Sustainable Computing (pp. 301-316). Chapman and Hall/CRC

❖ Shikha Singhal, Adwitiya Sinha, Buddha Singh, Context Awareness for Healthcare Service Delivery with Intelligent Sensors, In Book: Frontiers of Data and Knowledge Management for Convergence of ICT, Healthcare, and Telecommunication Services, EAI/Springer Innovations in Communication and Computing, Springer, pp. 61-83, 2022

❖ Rathi, M., Garg, M., Wahi, J. S., & Thar, M. D. (2022). Ambient Air Quality Analysis and Prediction Using Air Quality Index and Machine Learning Models The Case Study of Delhi. In Advanced Computational Techniques for Sustainable Computing (pp. 21-31). Chapman and Hall/CRC.

❖ Arora, P., Singh, S., & Rathi, M. (2022). Medical Search Engine. In Advanced Computational Techniques for Sustainable Computing (pp. 213-224). Chapman and Hall/CRC.

❖ Rathi, M., Arora, P., Srivastava, T., Arora, N., Agarwal, J., & Arjun, A. (2022). Crop Prediction and the Sustainability of Farming. In Advanced Computational Techniques for Sustainable Computing (pp. 273-284). Chapman and Hall/CRC.

❖ Gupta, C., & Rathi, M. (2022). Team Member Selection in Global Software Development A Blockchain-Oriented Approach. In Advanced Computational Techniques for Sustainable Computing (pp. 69-77). Chapman and Hall/CRC.

❖ Rathi, M., Lahiri, A., Aggarwal, A., Jindal, P., & Sinha, A. (2022). Multimedia Audio Signal Analysis for Sustainable Education. In Advanced Computational Techniques for Sustainable Computing (pp. 93-105). Chapman and Hall/CRC.

Book Chapters

❖ Rathi, M., Gupta, C., Shukla, R., & Raubins, R. (2022). Discernment of Malaria-Infected Cells in the Blood Streak Images Using Advanced Learning Techniques. In Advanced Computational Techniques for Sustainable Computing (pp. 139-152). Chapman and Hall/CRC.

❖ Rathi, M., Jindal, D., Thakral, M., & Arora, P. (2022). Sustainable Statistics for Death Cognizance Analysis. In Advanced Computational Techniques for Sustainable Computing (pp. 245-258). Chapman and Hall/CRC.

❖ Aggarwal, K., & Arora, A. (2022). Hand Gesture Recognition for Real-Time Game Play Using Background Elimination and Deep Convolution Neural Network. In Virtual and Augmented Reality for Automobile Industry: Innovation Vision and Applications (pp. 145-160). Springer, Cham.

❖ Nanda, A., Manju, Gupta, S. (2022). Breast Cancer Prediction Models: A Comparative Study and Analysis. In: Poonia, R.C., Singh, V., Singh Jat, D., DivÃ¡n, M.J., Khan, M.S. (eds) Proceedings of Third International Conference on Sustainable Computing. Advances in Intelligent Systems and Computing, vol 1404. Springer, Singapore.

Book Publications

❖ Megha Rathi, Adwitiya Sinha, Advanced Computational Techniques for Sustainable Computing, Eds., Taylor & Francis Group, Chapman and Hall, CRC Press, 338 pages, 2022 (ISBN: 9781003046431) (doi: 10.1201/9781003046431) (June 2022)

❖ Shikha Jain, Kavita Pandey, Princi Jain, Kah Phooi Seng, Artificial Intelligence, Machine Learning, and Mental Health in Pandemics: A Computational Approach. (2022). Netherlands: Elsevier Science.(ISBN: 978-0-323-91196-2) (https://doi.org/10.1016/C2020-0-04085-5)

Student Corner and Hub Activities

• Karan Bamal created an application called VAJRA and won the coding competition at Manthan 2022, an event organized by Ministry of Education, Government of India, Ministry of Innovation cell.

•An exhibition of projects was conducted at Technophilia-2022 on 18th February 2022 where almost 100 students participated to showcase their talent. The Main Judge of this event was Mr. Jaspreet Makka.

• Our students organized the OSDHack'22, a nationwide open hackathon being organized by the Open Source Developers Community of JIIT, Noida, where more than 450 participants took part and made this event a great success. The industry experts were Vaibhav Gupta, Aman Sharma, Arvind PJ, and Ujjawal Sharma.

• Hackin' Summer is one of the biggest and most awaited student-held Hackathon organized by JIIT Noida where more than 350 participants across Delhi-NCR took part and share their ideas about various tracks and themes of the event.

i-Aabhyantar

Alumni Spotlight

Alumnus are the brand ambassadors for any organization or institute who bear the flag for the future batches to follow. At JIIT, Noida we are proud to have a great legacy of having some really good and talented alumni who have not only excelled in their endeavors but also inspired many future generations to come. Few of our alumni are as:

- Vipul Khare (2013 Batch), Founder at Radical Logix, Noida, India. Cloud Based School ERP Software Solution with Mobile Apps has over 500 client-base. They help Schools to digitalize and automate their day to day processes with the School ERP software solution.

- Umesh Sachdeva (2011 Batch), CEO and co-founder, Uniphore Software Systems, Chennai. Uniphore extends the power of speech to revolutionize human-machine interaction. Their solutions allow any software application to understand and respond to natural human speech, thus enabling humans to use the most natural of communication modes, speech, to engage and instruct machines.

- Gaurav Shukla and Ashutosh (2017 Batch), Founders at Farzienginers and FarziCom. FarziCom and FarziCom Suite of Products are the Enterprise Digital Commerce Product that enables brands and retailers to achieve faster time to market, reach their customers across any channel, and uncover new growth areas.

Role of Industry 4.0/ Industry 5.0 in HealthCare

Dr. Payal Khurana Batra

The fourth industrial revolution, known as Industry 4.0, is the intelligent networking of industrial machinery and processes with the use of information and communication technology. It is the term used to describe the "present trend of automation and data sharing in manufacturing technologies, including cyber- physical systems (smart systems), the Internet of Things, cloud computing, cognitive computing, and building the smart factory." In fact, it is digital transformation of manufacturing/production and related industries and value creation processes. Compact and more effective factories are the consequence of digitalization, which is fueled by the use of sensors, software, networking, and big data analytics. It is also giving rise to new flexible business models. Many Industries like manufacturing, inventory management and supply chain management, automotive industry, agriculture and plantations, healthcare devices and services, utilities management (water, gas, and electricity), robots, and many more industries have all been transformed by Industry 4.0. Industry 4.0 appears to be a crucial component of the medical industry of the future, where software, technologies, and processes deliver effective and top-notch results in less time and money. It is an innovative approach to develop fresh ideas and carry out development in the medical industry by fusing technology, intelligent devices, and different software. In the medical industry, this transformation promotes automation and opens up new manufacturing options.

Industry 4.0 is a blessing for the healthcare industry because it performs a variety of tasks like analyzing patient data for better treatment, remotely monitoring patient health, reducing inventory by storing patient data in digital form and spreading awareness about the next stage of diseases, improving tool accuracy and management, automatically identifying diseases from radio images, assisting in the application of the proper control procedures for complicated surgeries, etc.

Industry 4.0 is gaining popularity, however still in immature stage. Industry 5.0 is all set to take next place. Industry 5.0, fifth industry revolution, is human centric design solution which focuses on interaction between human, smart machines and robots. It adds human touch to the Industry 4.0, i.e, products and solutions are personalized according to customer needs. This human touch or personalization is provided with the help of artificial intelligence, IoT, Cloud technologies and big data. Industry 5.0 offers many advantages such as personalization and creativity, cost optimization and greener solutions. Industry 4.0 works towards the process automation with the goal of minimizing the role of humans. Whereas, In Industry 5.0, this trend is reversed, it works towards the achieving balance between efficiency and productivity via human-machine interaction. In this regard, robots play a major role as they provide more accurate and precise information as compared to humans. Industry 4.0 produces smart products whereas industry 5.0 works toward interactive products. Industry 5.0 also has many applications in various domains however it plays a substantial role in the healthcare sector. Now a day's medical sector is focusing towards the patient. personalization in which device can be customized according to the patient requirements so that doctors can receive precise information about the patient like wearable devices. Industry 5.0 helps in capturing 4D radiological images which provides accurate information about the body part, its position and movement. These scanning devices automatically track and analyze the patient's health parameters. Further, medical parts can be manufactured according to the need of the patient like which material to use and how they accommodate in the patient's body etc. Industry 5.0 can gain knowledge from the big data by creating digital network which provides accurate information about the patient's vital parameters. Further, collaborative robots can assist doctors in performing complex surgeries in accurate and efficient manner.

In short, in future, Industry 4.0 and Industry 5.0 will become an integral part of the medical filed/health sector. Industry 4.0 and Industry 5.0 also bring many opportunities and challenges too. Both industries work towards the automation via machines or human machine interaction using IoT, cloud/fog/edge computing, artificial intelligence and big data technologies. This opens up many opportunities of interdisciplinary research for both Industry and academia. However, in health sector, besides technological issues other allied issues needs to be tackled also such as keeping patient's privacy, securing health records, providing real time information to the doctors for timely decision, trust building on the machines and robots etc. To summarize, Industry 4.0 and Industry 5.0 are still in immature stage, however soon they will become are integral part of our day to day life leading to Society 5.0.

Network-On-Chip: The Next Generation of SoC Integration

Dr. Bansidhar Joshi

"The network is the computer," a phrase proposed by Sun Microsystems' John Gage in 1984, proven extremely perceptive. This concept is resurfacing- this time in the System-on-Chip (SoC) domain. Functions in a chip communicating with each other, not via simple wires but via sophisticated network devices such as switches, protocol adapters, packetizers, etc. are not unrelated to a group of computers communicating over a network within a cabinet, or a room, back in 1984.

Before SoCs, engineers could transport data from A to B on a board via an assembly of wires. Managing cable length and ensuring that A and B use the same communication protocol posed the most concern, but that was about it. The true activity occurred within the compute components. Designing the wiring connecting these priceless components was then a simple task.

Issues with Heterogeneous Computing and System-on-Chip Designs

An SoC is a single-chip system that combines numerous computational and functional components onto a single piece of silicon. SoCs embrace heterogeneous computing and hardware acceleration, in which specialized processing blocks are employed for specific, compute-intensive applications. As a result, it is usual for a SoC to have certain general-purpose computing blocks, such as CPUs and GPUs, as well as several accelerator units, such as neural processing units (NPUs) and digital signal processors (DSPs).

While this design improves performance and energy efficiency, it has a number of control and management concerns. SoCs in data-intensive applications confront the issue of controlling, organizing, and managing the huge volumes of data they are required to deal with. From both a floor-planning standpoint and a systems perspective, managing data flow to and from memory and the number of distinct functional blocks offers a non-trivial challenge.

To overcome these data-related difficulties, practically every SoC employs a network-on-chip (NoC).

What is an NoC?

An NoC interconnects practically every component of a SoC, providing a clear and well-defined route for data to move from block to block. An NoC is often made up of various segments of wires and routers that are planned out to prevent parasitics, which cause increased loss and delay throughout the SoC. This is usually in the shape of a city-like grid pattern.

The NoC manages the flow of data across the SoC through the use of network interface (NI) modules. These modules are frequently employed to convert data packets produced by processing cores into fixed-length, flow-control digits. These digits enable the NoC's routers to route data to the proper functional block. Traditionally, NoC functions are classified into layers such as application, transport, network, data link, and physical. As a result, a NoC router will need both hardware and software implementations to support the operations of the above levels. The NoC-based architectures have four major characteristics: Topology, Routing, Flow Control, and Router Micro-architecture. The Topology deals with the physical routes that are laid out at the time of network fabrication. Routing determines the directions/routes in which flits shall move to reach their destinations optimally. The Flow Control manages the allocation of network resources like Buffers, bandwidth, etc. Finally, Router Micro-architecture deals with the actual implementation of a router associated with an IP core.

The figure here shows how the major aspects of an On-Chip Network are analogous to real time communication traffic. Here, for communicating between JIIT128 and JIIT62, the Road Network is analogous to the Topology aspect of NoC. The Series of road segments from source to destination relates to the Routing aspect. Traffic signals at end of each road segment define a Flow Control scheme. And finally, the Design of the traffic intersection (like the number of lanes, and the algorithm for turning signals red/green) defines the Router Microarchitecture.

NoC IP Advantages

Integrated circuits (ICs) often utilize point-to-point connections, in which each signal or connection is conveyed via a single wire. This can make the design of the chip quite complex and dense, which can be confusing and inconvenient for relatively larger designs and networks that must employ the use of multiple physical connections that will consume the majority of the chip's tangible space and confine the system's overall performance.

By incorporating NoCs into a system, it is feasible to drastically reduce the number of wires utilized and eliminate backside wire routing congestion. Reduced circuit density also facilitates the user's comprehension of routing and switching operations and reduces the needed hardware. Additionally, the sparseness of the connections decreases interference and makes the system more scalable and energy efficient. A further advantage of sparsity is that it facilitates the resolution of timing closure concerns through the placement of pipeline registers and slices at exact positions. Eventually, due to the reduction of the hardware required to execute switching and routing activities, SoCs that utilize NoCs tend to operate at higher frequencies.

AI for Engineering Education

Dr. Suma Dawn

Engineering Education is a field of teaching-learning practices related to the professional practice of engineering. Artificial Intelligence (AI) has given a considerable boost to such privations. In fact, having a human-centric approach to AI is one of UNESCO's mandate calls. AI has revolutionized many real-life requirements and procedures. Its outreach now has the potential to address some of the enormous challenges in the education domain, thereby innovating and invigorating it. Knowledge and research can then be made more accessible to all.

With the advancement of technology and computing powers, the core knowledge strengthening of learners is mandatory. While one aspect is content availability, another issue relates to its testing, and another to the analysis of the results with the overall capsule of learners' learning styles. Knowledge and practice of the underlying principles are essential for individuals who wish to learn computer programming languages. Only with empowerment in Education can sustainable development happen. Computer programming languages form the backbone of real-life projects that help grow and develop from individual to national and international levels considering societal, ethical, and environmental needs. With such a vision, Artificial Intelligence for Education (AIE) is gaining importance. It can help instructors, evaluators, students, institutes, and learning centers groom future thinkers, designers, and developers.

For empowering Education and improving educational equity and quality, AI-based procedures can be of much practice to practitioners and policy-makers who relate to the education communities. AI offers opportunities that, if implemented with ethical practices, can revolutionize the Education domain. Some of the cornerstones are easy access to quality content, appropriate evaluation, and real-time analysis. There are various ways in which AI can be integrated with Education, including:

❖ Real-time automatic generation of questions: In comprehensive content, the generation of questions can use techniques from Natural Language Processing, commonly called NLP. Apart from programming platforms, there is a considerable demand for a stable and efficient tool that can help in the automatic generation of learners' exercises in a computer programming language such as Python, C, C++, Java, and others. These questions may be of short-answer type such as multiple-choice questions, true/false, find-the-output of the given code, etc.

❖ Plagiarism checking: Written content, such as using a particular set of words or the structure of the language text, may be plagiarized.

❖ Chatbots: These can help quickly and easily understand a particular topic in real-time, again by using NLP and appropriate keywords.

❖ AR-VR: The generation of a virtual 3D model or a hologram depiction can ease the clarity of a topic.

❖ Learning Management Systems: A centralized and well-designed Learning Management System can help not only the instructor and the learner but also in the management of many activities, such as communication in the form of timely reminders or messages to students & guardians, progress tracking, feedback generation, etc.

❖ Robotics, IoT, and AI: An amalgam of such devices can make teaching-learning exciting and intuitive. The handling of repetitive tasks can be delegated to the bots, while experiments can be more stimulating.

Some of these topics are known to be in their research phases. However, many tools that have been made can also be used to a certain extent. Most of these software applications are known to use aspects of AI, Machine Learning, Deep Learning, and Natural Language Processing. Ivy, a chatbot set, has been designed to assist with procedures such as filling details in application forms, planning recruitment campaigns, etc. Nuance can be used by students and faculty, helping students who find it challenging to write or type using speech as input. Self-learning is encouraged through Altitude Learning. Cognii implements training environments; language learners can use Knowji. Critical STEM skills can be mastered using Querium; Curriculum solutions looked up through Carnegie Learning that offers help in math, literacy, world languages, and others and is very relatable to Alta. Gradescope can be used for assessment and feedback, and many others.

An ensemble of such modules can transform teaching-learning. The disruption of MOOCs can be used as a blessing for engaging instructors, learners, and all stakeholders in the education communities. Education will not suffer due to distance or lack of amenities such as availability of content or invigilators or question-paper setters, etc. Teachers and educators can find more engaging ways of teaching depending on the pupils' learning styles. Their competency levels can be judged and nudged at an individual level or even as a group. Tracking students' progress can be easier with analysis report generation for feedback and management. Each opportunity comes with its own set of trials. AI for Education is also a Juggernaut. Challenges are there at each step and in every module of the mission. Application acceptability and usability are another set of obstacles that would need smoothening. The pros outweigh the cons. AI is here to stay and can now be seen as a crucial driver for educational changes.

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सब तेरा ?

नहीं आई रहने घर तुम्हारे, नहीं देखना आलीशान मकान तुम्हारा।
यहाँ कुछ पेड़ हुआ करते थे, जिनकी शाखों पे था घर हमारा।

सारा दिन ढूंढती फिरती हूँ, अपने उस एक बच्चे को।
बाकी सब तो उड़ सकते थे, न आता था उड़ना उसको।

डरा होगा वो कितना, जाने कैसे कैसे घबराया होगा।
छोड़ चली गयी माँ, मन में उसके यही आया होगा।

नहीं मिलता पास में दाना पानी, दूर चले गए खेत खलिहान।
निकली थी चार दाने खोजने , खो   दिया अपना जहान ।

हँसते जब बच्चे आँगन के तेरे, होता कुछ कम मन का भार।
था जहाँ कभी घर मेरा ,आबाद वहाँ है किसी का तो संसार।

जा रही मैं, खुश रहे तू, हमेशा खिला रहे तेरा   बागवान |
ले लो   सारी धरा तुम्हारी, रख लो तुम ये सारा आसमान |

--Dr. Shailesh Kumar

Upcoming Events 2022

❖ June 20–July 02, 2022 - Two Weeks Summer school on "Quantum Computing and Its Applications"

❖ July 04-09, 2022 – One Week Online Faculty Development Program (FDP) on "Full Stack Engineering"

❖ July 25-31, 2022 – One Week Online Faculty Development Program (FDP) on "Blockchain Technology & Applications"

❖ July 25 – August 07, 2022 – Two Weeks Summer school on "Quantum Computing and Its Applications"

❖ August 04-06, 2022 – 14th International Conference on Contemporary Computing (IC3 2022)

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