Newsletter

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Issue - 6

January 2022

Department Mission

To impart education that encourage students to read critically, reason analytically, communicate persuasively, apply professionally and prepare them to excel in the field of computing.

Department Vision

To recognize itself as globally renowned learning centre in the field of computer science & engineering and foster the research and innovation for the global good.

संगणक विज्ञान एवं अभियांत्रिकी विभाग
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Events under Diamond Jubilee Year Celebration


Workshop/Conference/STTP Organized

1. **"National Workshop on Privacy and Security in Cyber Physical Systems (PSCPS 2021)" 23-25 November, 2021.**

   Coordinator: Dr.Keyur J. Parmar & Dr.Balu L. Parne

   About the workshop: The workshop was aimed to assist participants from academia and industry as well as PG/PhD students about emerging research topics in the area of Security and Privacy in Cyber Physical Systems, covering topics from modern cryptography, information security, network security, privacy/anonymity, and applications in the areas such as Machine Learning, Internet of Things (IoT), Big Data, and Blockchain Technology. The workshop also included hands on sessions on topics related to data security and privacy in cyber physical systems.

   Total 34 participants including faculty members, Ph.D./PG/UG students from various academic institutes have attended the workshop.

   Glimpses of Workshop:
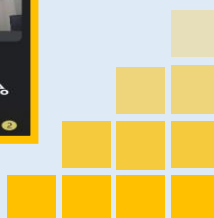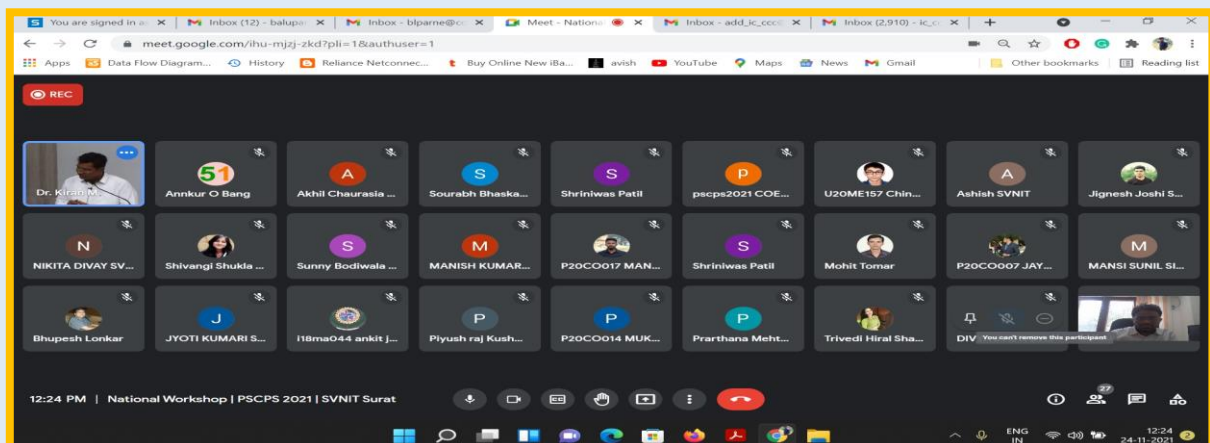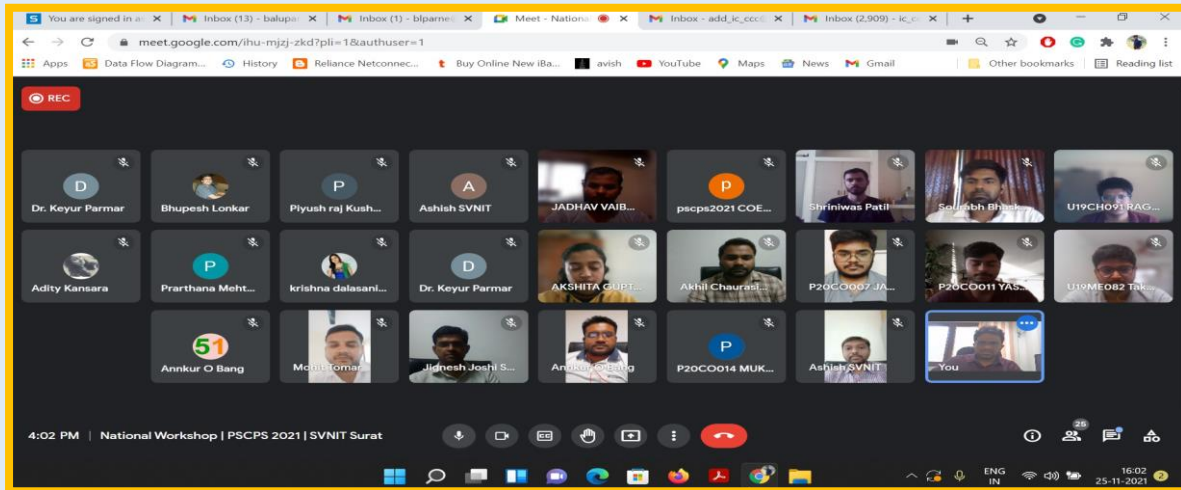
PSCPS 2021 Workshop Keynote Talks:

1. **Name of speaker**: Dr. Suraj Sharma (IIIT Bhubaneswar)
   Title of the Talk: Privacy Preservation on Cyber-Physical Systems Using Blockchain
2. **Name of speaker**: Dr. Karan Verma (NIT Delhi)
   Title of the Talk: Security in Mobile Intrusion Prevention Systems (IPS)
3. **Name of speaker**: Dr. Bhawana Rudra (NITK Surathkal)
   Title of the Talk: Security Aspects of CPS and Research Challenges: Smart City-Case Study
4. **Name of speaker**:Dr. Kiran Manjappa(NITK, Surathkal)
   Title of the Talk: IoT Device Security Using Physically Unclonable Functions (PUFs)
5. **Name of speaker**: Dr. Piyush Shukla (RGPV, Bhopal)
   Title of the Talk: Secure Techniques for Smart Cyber-Physical Systems
6. **Name of speaker**: Dr. Sanjeet Nayak(IIITDM Kanchipuram)
   Title of the Talk: Secure Computations in Cyber Physical Systems

2. **Two days workshop on "Big Data Analytics" 6-7 December 2021.**

   Coordinator: Dr. Rupa G. Mehta and Dr. Dipti P. Rana

   About the workshop: The department organized 2-days online national workshop on Big Data Analytics during 6-7 Dec. 2021. The workshop's goal was to provide the knowledge in the field of big data analytics as nowadays it is utilized by variety of applications to improve the current digital life. This event was conducted as a part the Diamond Jubilee Year celebration of the Institute.

Eminent personalities from academic institute like Prof.Anappa (NIT Surathkal), Prof. Sriparna and Prof. Sudhir Kumar (IIT Patna), Prof.Nitin (IIT Ropar), Dr.Sonali Agarwal (IIIT Allahabad), Prof. P. Krishna Reddy (IIIT Hyderabad), Dr.Deven Shah and Prof. Kamal Shah (TCET Mumbai) have delivered talks with technical depths required to resolve the real life problems and unwrapped new issues to take up in the area of big data analytics. Their expert talks covered the topics like big data utilization to reduce crime by Indian police, research problem of dialog based system can be effectively solved, how to achieve localization for IoT sensors, the usage of big medical stream data and its implementation solution using Hadoop ecosystem, the problems faced at different stages by Indian farmers, Security in the big data applications, the infrastructure related issues in cloud and fog

Computing and how to deal with big data analytics on future quantum computing technology. Industry expert Ms. Sayee, Software Developer from the current big industry AWS, Seattle, Washington discussed the real life issues and their solutions of Indian Aadhaar Service, paytm, Netflix and MetroPlusHealth.

Total 91 participants from faculties, Ph. D. pursuing scholars, PG students and enthusiastic UG students from various academic institutes from all streams of education from Science to technology to research have attended the workshop. Participants' response was overwhelming and they participated actively throughout all the online sessions. The workshop has fulfilled and open the path to achieve the participants' research and academic goals.

Glimpses of Workshop:
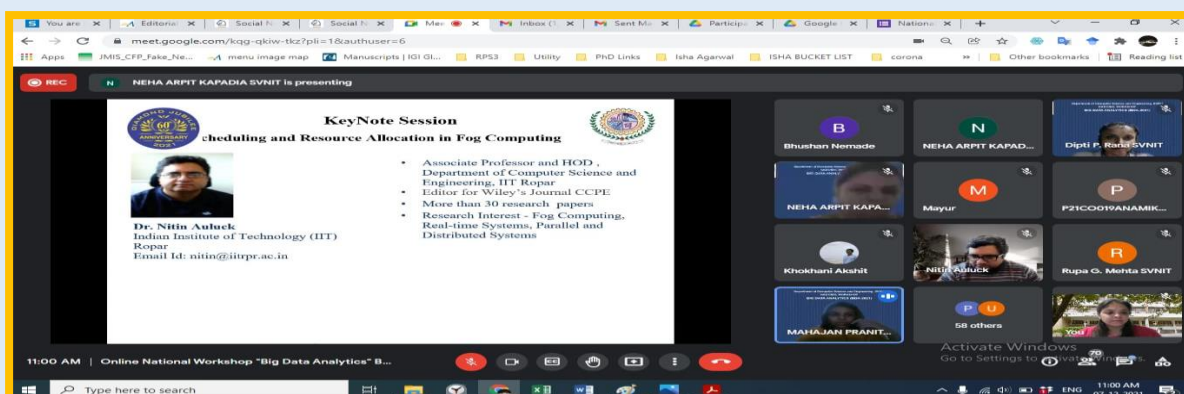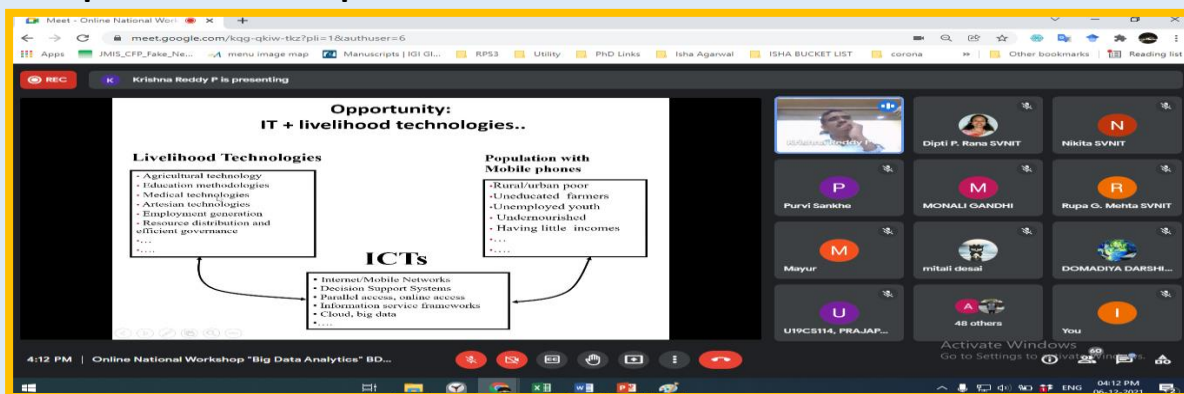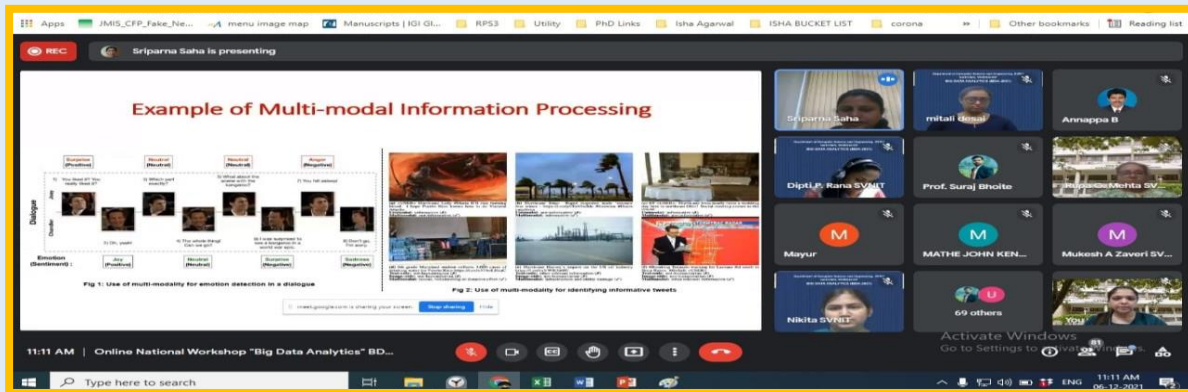
3. **"International Conference on Security, Privacy and Data Analytics (ISPDA 2021)" 13-15 December, 2021.**

Coordinator: Dr. Udai Pratap Rao, Dr. Bhavesh N. Gohil and Dr. Snakita J. Patel

About the conference: The goal of "International Conference on Security, Privacy and Data Analytics (ISPDA 2021)" was to bring together researchers from industry and academia working in the field of security, privacy and data analytics from both technological and social perspective. The conference focused on the rapidly expanding research field of Information Security and Privacy and data analytics. Total 68 papers were received out of which 27 papers were accepted and 25 papers were registered and presented in the conference. The registered papers of the conference are published as proceedings with Springer in their prestigious "Lecture Notes in Electrical Engineering (LNEE)" series. LNEE series is indexed by EI Compendex and Scopus databases.

Glimpses of Conference:
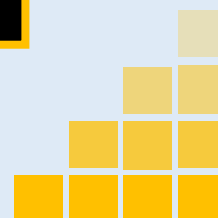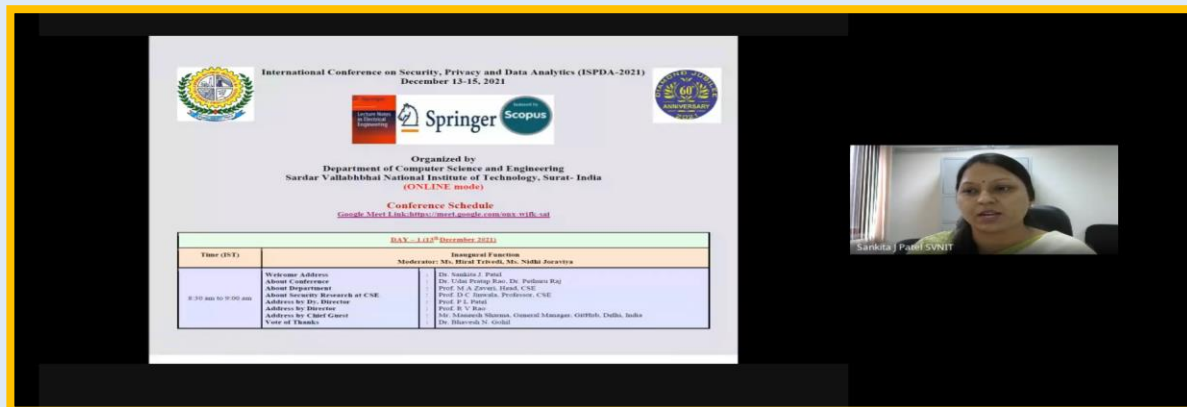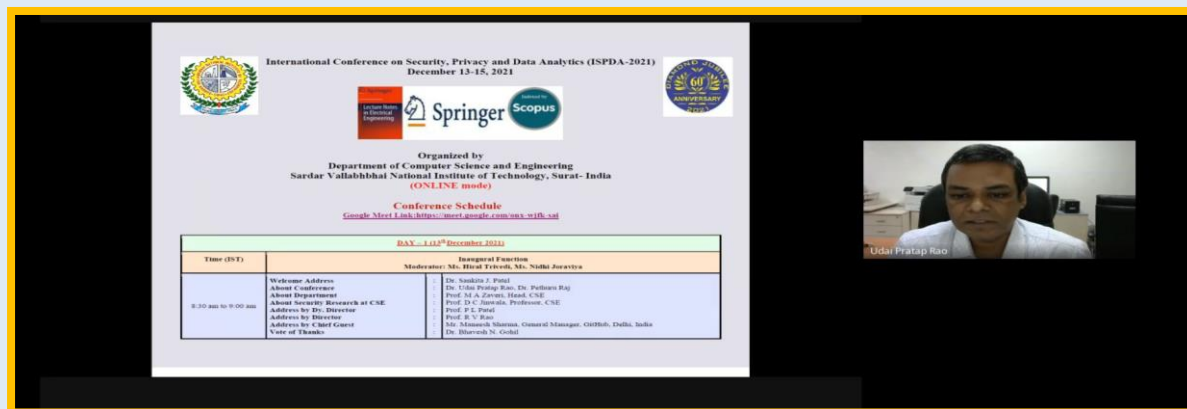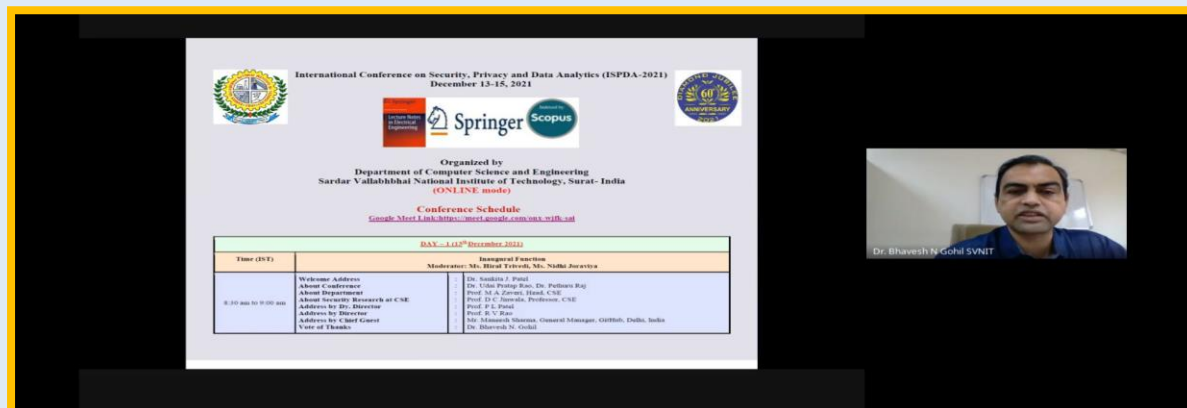
ISPDA 2021 Conference Keynote Talks:

1. **Name of speaker:** Prof. Mohammad Obaidat, IEEE Fellow and SCS Fellow, Founding Dean and Professor, College of Computing & Informatics, University of Sharjah, UAE.
   Title of the Talk: Recent Research Efforts on Machine Learning
2. **Name of speaker:** Prof. Saraju Mohanty, Department of Computer Science and Engineering, University of North Texas (UNT), Denton, USA.
   Title of the Talk: Security by Design for IoT- Enabled Systems
3. **Name of speaker:** Prof. Danda B. Rawat, Department of Electrical Engineering & Computer Science, Howard University, Washington, DC, 20059, USA.
   Title of the Talk: Cyber security for Artificial Intelligence and Artificial Intelligence for Cyber security: The Triumph and Tribulation
4. **Name of speaker:** Dr. George Trawick, Associate Professor, Mississippi State University, United States
   Title of the Talk: The Cyber Security Executive Order (14028) It's a Big Deal
5. **Name of speaker:** Prof. Sandeep K. Shukla, Department of Computer Science and Engineering (CSE), IIT Kanpur.
   Title of the Talk: OT/ICS Security – Rising Challenges and Mitigations
6. **Name of speaker:** Dr. Ashish Kundu, Head of Cyber security Research at Cisco Research, USA.
   Title of the Talk: Blockchain and The Vedas Connection

Faculty Achievement

1. **Dr. Udai Pratap Rao,** has Participated in 3rd Conference on **"Computational Thinking"** in Schools, Pune (Virtual Event) 29th September to 2nd October, 2021.

2. Sanction of a funded research project entitled "Design and Implementation of Secure Service and Attribute-based Authorization Model in Dynamic and Constrained-specific IoT Environment", funded by IHUB NTIHAC Foundation, IITK under the aegis of National Mission on Interdisciplinary Cyber-Physical System (NM-ICPS), Department of Science and Technology, Government of India, Budget: 12.21 Lakhs, Duration: 03 Years. (Ongoing).

Dr. Sankita J. Patel has attended and presented paper in the 18th International Conference on **"Security and Cryptography (SECRYPT 2021)"** held in online mode during 6-8 July, 2021.

Dr. Balu L. Parne Awarded the certificate for Participating as Mentor in **"Smart India Hackathon 2020"**

Dr. Keyur J. Parmar has attended AICTE Training and Learning (ATAL) Academy Sponsored FDP on **"Digital Forensics in Cyber Security (Online)"** at Centre for Development of Advanced Computing (CDAC), Noida, 2-8 July, 2021.

Dr. Keyur J. Parmar has attended AICTE Training and Learning (ATAL) Academy Sponsored FDP on **"Cyber Security & Cryptography: Trends and Technologies"** at, Indian Institute of Information Technology, Design and Manufacturing (IIIT-DM), Kancheepuram 4-8 October 2021.

Expert Lectures Delivered by Faculty Members

Dr. Keyur J. Parmar delivered talk on "Blockchain for Security in Internet of Things (IoT) National Workshop on Privacy and Security in Cyber Physical Systems (PSCPS)" SVNIT, Surat 23-25 November, 2021.

Dr. Keyur J. Parmar delivered talk on "Security and Privacy Issues in IoT and Countermeasures" Two days workshop on IoT, IoT Security and Malware Analysis, RashtriyaRaksha University, Gandhinagar26-27 November, 2021.

Dr. Keyur J. Parmar delivered talk on The Double-Spend Problem (Date: 4-July-2021), AICTE Training and Learning (ATAL) Sponsored One Week Faculty Development Program (FDP) on Blockchain: A Disruptive Technology, Pandit Deendayal Energy University, Gandhinagar 02-06 July, 2021.

Dr. Bhavesh N. Gohil delivered talk on "Cyber Security Awareness and Safe Mobile Use" at Mora Village, Choryasi as a part of Unnat Bharat Abhiyan(UBA) outreach activities, 16th October, 2021.

Dr. Bhavesh N. Gohil delivered talk on "Case study of Grey Wolf Optimizer" during STTP on Emerging Technologies in Distribution System and Distributed Generation, organized by Department of Electrical Engineering, SVNIT, Surat, 27th September – 1stOctober, 2021.

Dr. Bhavesh N. Gohil delivered talk on "Cloud Security and Forensics" during ATAL FDP on Recent Trends in Cloud Computing organized by the Department of Computer Science and Engineering & IQAC, DRIEMS Engg. College, Tangi, Cuttack, Odisha, 6-12 September, 2021.

Dr. Bhavesh N. Gohil delivered talk on "Cloud Security and Forensics" during ATAL FDP on Cyber Threat Intelligence and Digital Forensics organized by the Department of Computer Science and Engineering, SVNIT Surat during July 19-23, 2021.

Dr. Sankita J. Patel delivered talk on "Cyber Privacy: Issues and Countermeasures" at the National Conference on Emerging vistas of Computer Science & IT in 21st century, Parul University, Gujarat, 18thDecember 2021.

Dr. Sankita J. Patel delivered talk on "Machine Learning for Cyber Security" at GUJCOST and DST sponsored Short Term Training Program on Advanced trends in AI, ML and Deep Learning, at Parul University, Gujarat, 17thSeptember, 2021.
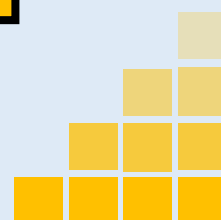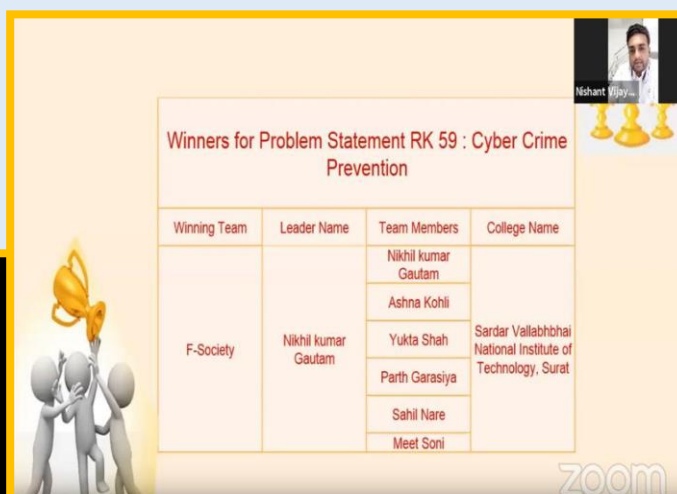
Dr. Sankita J. Patel delivered talk on "Privacy Issues and Countermeasures in Data Publishing: A Case Study of Online Social Media" at National Workshop on Privacy and Security in Cyber Physical Systems (PSCPS 2021)" organized by Department of Computer Science and Engineering, SVNIT during 23-25 November, 2021.

Dr. Mukesh A. Zaveri delivered talk on "Fundamentals of Machine Learning and Deep Learning" during AICTE-RGPV Joint Teachers Training Program on Data Science for Machine Learning and IoT with Health Care applications organized by Sri Aurobindo Institute of Technology, Indore during 23-28 August, 2021.

Dr. Mukesh A. Zaveri delivered talk on "Artificial Intelligence and Machine Learning" during ATAL FDP on Artificial Intelligence in Image Processing organized by Department of Electronics and Communication Engineering, Indian Institute of Information Technology, Nagpur during 20-24 December, 2021.

Student Achievements

Winners for Problem Statement RK 59 : Cyber Crime Prevention

Winning Team	Leader Name	Team Members	College Name
F-Society	Nikhil kumar Gautam	Nikhil kumar Gautam	Sardar Vallabhbhai National Institute of Technology, Surat
		Ashna Kohli	
		Yukta Shah	
		Parth Garasiya	
		Sahil Nare	
		Meet Soni	

SIH-2020 Project Details

Nikhil Kumar Gautam (U18CO053), Sahil Nare (U18CO071), Meet Soni (U18CO075), Parth Garasiya (U18CO014) and Yukta Shah (U18CO063) participated in Smart India Hackathon (SIH-2020) and the team has won the Smart India Hackathon (SIH-2020) at nodal center, SAGE University, Indore.

The team has got an opportunity to extend their work on the Problem Statements - RK59 related to 'Detection and prevention of Cyberbullying on Twitter, Facebook and YouTube etc'. The solutions proposed in Hackathon have been prototype / basic hence its proposed to offer further time-span of 3 to 6 months with a budget support of 3 lakhs for its development to the selected team. Each student was offered the stipend of Rs. 5000/- for maximum six months and Rs 1.2 lakh per project for the software or hardware requirements as applicable during the development.
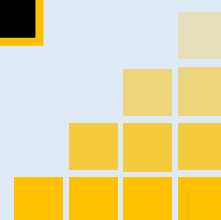
Mr. Ankur O. Bang has secured 1st runner up position in a paper presentation in ISPDA 2021 for **"White-Box Encryption Scheme for Resource-constrained IoT Devices"** organized by the Department of Computer Science and Engineering during December 13-15, 2021.

Publications

Kaushal Shah, Devesh C. jinwala, "Privacy preserving secure expansive aggregation with malicious node identification in linear wireless sensor networks", Frontiers Computer Science journal, December 2021.

Anshuman Patel, Devesh C. Jinwala, "A reputation-based RPL protocol to detect selective forwarding attack in Internet of Things". International Journal of Communication Systems, October 2021.

Anshuman Patel, Devesh C. Jinwala, "A Trust-Integrated RPL Protocol to Detect Blackhole Attack in Internet of Things". International Journal of Information Security and Privacy (IJISP), October 2021.

Ankur O. Bang, Udai Pratap Rao, "A New Ecosystem for Digital Identity Verification Using Blockchain". Blockchain for Information Security and Privacy, December 2021.

Gordhan Jethava, Udai Pratap Rao, "An Interaction-Based and Graph-Based Hybrid Approach to Evaluate Trust in Online Social Networks (OSNs)". Arabian Journal for Science and Engineering, November 2021.

Nikunj Domadiya, Udai PratapRao,"Privacy Preserving Association Rule Mining on Distributed Healthcare Data: COVID-19 and Breast Cancer Case Study". SN Computer Science, Springer, 2, 418 2021.

Ankur O. Bang, Udai Pratap Rao, "A Novel Decentralized Security Architecture Against Sybil Attack in RPL-based IoT networks: a focus on smart home use case", Journal of Supercomputing 2021.
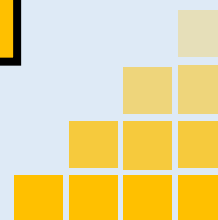
Ankur O. Bang, Udai Pratap Rao, Pethuru Raj and Alok Kumar, "White-Box Encryption Scheme for Resource-constrained IoT Devices", In the proceedings of International Conference on Security, Privacy, and Data Analytics ISPDA 2021.

Ankur O. Bang, Udai Pratap Rao, Pallavi Kaliyar and Mauro Conti, "Assessment of Routing Attacks and Mitigation Techniques with RPL Control Messages: A Survey", ACM Computing Surveys, 2022, 55, 2, Article 44, pp. 1-36. DOI: https://doi.org/10.1145/3494524. (SCI Indexed)

Ankur O. Bang, Udai Pratap Rao, "EMBOF-RPL: Improved RPL for Early Detection and Isolation of Rank Attack in RPL-Based Internet of Things", Peer-to-Peer Networking and Applications, 2022, Springer. https://doi.org/10.1007/s12083-021-01275-3. SCI Indexed)

Nikunj Domadiya, Udai Pratap Rao, "Elgamal Homomorphic Encryption based Privacy Preserving Association Rule Mining on Horizontally Partitioned Healthcare Data". Journal of The Institution of Engineers 2021.

Jenish Dhanani, Rupa G. Mehta and Dipti P. Rana, "Legal Document Recommendation System: A Cluster Based Pairwise Similarity Computation", Journal of Intelligent & Fuzzy Systems. 17 November 2021.

Anjali S. More and Dipti P. Rana, "Performance enrichment through parameter tuning of random forest classification for imbalanced data applications", December 2021.

Jenish Dhanani, Rupa G. Mehta and Dipti P. Rana, "Sentiment Weighted Word Embedding for Big Text Data", International Journal of Web-Based Learning and Teaching Technologies (IJWLTT). November 2021.

Navodita Saini, Dipti P. Rana, "Dictionary based Gender Identification and Gender based Sentiment Analysis with Polarized Word2vec", Fourth International Conference on Futuristic Trends in Networks, Computing and Communication Technologies (FTNCT), Nirma University Ahmedabad, December 2021.

Sourabh Bhaskar, Keyur J. Parmar and Devesh C. Jinwala, A Survey of "Ciphertext Processing Techniques" 4th International Conference on Futuristic Trends in Network and Communication Technologies (FTNCT-2021), Springer, India, December 2021.

Shriniwas Patil and Keyur J. Parmar, "Differential Privacy Mechanisms: A State of the Art Survey, 4th International Conference on Futuristic Trends in Network and Communication Technologies (FTNCT)" Springer, India, December 2021.

Nishtha Srivastava, Ashish Chaudhary, NidhiJoraviya, Bhavesh N. Gohil, Suprio Ray, UdaiPratap Rao, "A Review of Machine Learning based Intrusion Detection Systems on Cloud" International Conference on Security, Privacy and Data Analytics, LNEE, December 13-15 2021.
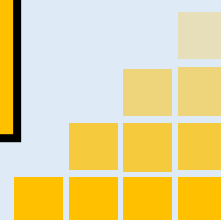
Shubham Gupta, Balu L.Parne, Narendra S. Chaudhari, and Sandeep Saxena, "SEAI: Secrecy and Efficiency Aware Inter-gNB Handover Authentication and Key Agreement Protocol in 5G Communication Network" 2021.

Shivangi Shukla and Sankita J. Patel, "A novel ECC-based provably secure and privacy-preserving multi-factor authentication protocol for cloud computing", Computing, pp. 1-30, Springer, 2022

Hiral Trivedi and Sankita J. Patel, "Privacy Preserving Scalable Authentication Protocol with Partially Trusted Third Party for Distributed Internet-of-Things", In Proceedings of the 18th International Conference on Security and Cryptography (SECRYPT), ISBN 978-989-758-524-1, ISSN 2184-7711, pp. 812-818, 2021.

Rutal Mahajan and Mukesh A. Zaveri, "Harnessing Emotive Features for Emotion Recognition from Text" International Journal of Advanced Computer Science and ApplicationsVolume 12, Issue 7, pp. 166-175, 2021

Book Chapters

Mehak Wadhwani, Nisha Mansoori, Shivangi Tanwar, Aanchal Handa, and Bhavesh N. Gohil, **"A Secure Online Voting System Using Blockchain"** Blockchain for Information Security and Privacy, CRC Press, Taylor & Francis Group, 2021.

Atharva Kalsekar, Avinash Jaiswal, Rogin Koshy, Sameer Mandloi, and Bhavesh N. Gohil, **"Secure Electronic Health Records (EHR) Management Using Blockchain"**, Blockchain for Information Security and Privacy, CRC Press, Taylor & Francis Group, 2021.

S. Gupta, K. Shah, A. Hirapara, D. Mistry, Ankur O. Bang, & Udai Pratap Rao, A New Ecosystem for Digital Identity Verification Using Blockchain, in Blockchain for Information Security and Privacy, CRC Press, Taylor and Francis Group 2021.

Mahajan P., Dipti P. Rana, "Investigating Clinical Named Entity Recognition Approaches for Information Extraction from EMR", Tracking and Preventing Diseases with Artificial Intelligence. Intelligent Systems Reference Library, vol. 206. Springer, Cham, 15 July 2021.

Navodita Saini and Dipti P. Rana, "Gender-Based Tweet Analysis (GTA)" In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 255-267. Hershey, PA: IGI Global, 7 Jun 2021.

IshaY Agrawal, and Dipti P. Rana, "Fake News and Imbalanced Data Perspective" In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 195-210. Hershey, PA: IGI Global, 7 Jun 2021.

Mitali Desai, Rupa G. Mehta and Dipti P. Rana, "An Experimental Analysis to Learn Data Imbalance in Scholarly Data: A Case Study on ResearchGate." In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 242-254. Hershey, PA: IGI Global, 7 Jun 2021.

Isha Y Agrawal, Kshitij R. Suri, Punitkumar Jain, Saumya Awasthi, Krittika Roy and Dipti P. Rana, "Behaviour Anomaly Detection With Similarity-Based Sampling for Imbalanced Data." In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 177-194. Hershey, PA: IGI Global, 7 Jun 2021.

Isha Y. Agarwal, Devanshi Bhatia, Jay Rathod, Kaneesha J. Gandhi, Harshit Sodagar, and Dipti P. Rana, "Detection of Bot Accounts on Social Media Considering Its Imbalanced Nature" In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 162-176. Hershey, PA: IGI Global, 7 Jun 2021.

Jenish Dhanani, , Rahul Lad, Amogh Agrawal, Karan Chevli, Jashwanth Gummula Reddy, Rupa G. Mehta andDipti P. Rana, "Indian Judgment Categorization for Practicing Similar Judgment Identification." In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 232-241. Hershey, PA: IGI Global, 7 Jun 2021.

A. S. More, Dipti P. Rana, "Review of Imbalanced Data Classification and Approaches Relating to Real-Time Applications", In Data Preprocessing, Active Learning, and Cost Perceptive Approaches for Resolving Data Imbalance, pp. 1-22. Hershey, PA: IGI Global, 7 Jun 2021.

Sankita J. Patel, Ujjwal Kumar, Hrishabh Sharma, AmrutaMulay and Rishabh Kumar, Leveraging "Blockchain Technology for Decentralized Domain Name Broker Service", Blockchain for Information Security and Privacy. Auerbach Publications, Taylor & Francis Group, 2021.
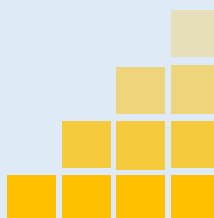
MoU Signed by Department

The Department has signed Memorandum of Understanding (MoU) with following universities for research collaboration and various academic activities.

University of New Brunswick, Canada.

Rashtriya Raksha University, Gandhinagar, Gujarat, India.

National Forensic Sciences University, Gandhinagar, Gujarat, India.

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