Activity Report (news bulletin) of IT Dept. for October 2024

1. Expert Lecture/Seminar/Courses Organized by Department during October 2024:

Iteron Club of Dept. of Information Technology had organized an expert session on "Machine Learning and its Application" by Mr. Suchit Tiwari, CEO at Cognifront, Nashik on 11th Oct. 2024.

An expert session on "Machine Learning and its Application" by Mr. Suchit Tiwari

Iteron Club of Dept. of Information Technology had organized an expert session on " Cyber Security Awareness" by Mr. Onkar Gandhe, COE Cyber Sakshar, Nashik on 15th Oct. 2024.

An expert session on " Cyber Security Awareness" by Mr. Onkar Gandhe

Iteron Club of Dept. of Information Technology had organized an online expert session on " Best Practices for Coding" by Mr.Umesh Gaikwad,Technical Lead at Sauce Consulting in Pune on 19th Oct. 2024.

Iteron Club of Dept. of Information Technology had organized an expert session on " Artificial Intelligence" by Mr. Atishkumar Gangnar, AI/ML Engineer at Clavigerous system, Nashik on 23rd Oct.. 2024.

An expert session on " Artificial Intelligence" by Mr. Atishkumar Gangnar

2. Papers Presented/Published in the Journal by Staff during October 2024:

Title of Paper: Privacy-Preserving Location Information Fusion for Secure Localization in Cyber-Physical Social Systems: A Case of Consumer's Trustworthy Personalized Recommendation.

Name of Journal: IEEE Transactions on Consumer Electronics

ISSN Number: 0098-3063

Names of Authors: Dr. Darshan V. Medhane

Abstract: Cyber-physical social systems (CPSS) have developed significantly in the last decade as a result of their effective computing and communication capabilities. Security and safety concerns yet continue to be the biggest obstacle to the wider acceptance of CPSS in spite of all technological developments. In this work, we investigate the problem of secure localization of roaming users along with preserving their privacy in CPSS through location information fusion. We present a novel idea of privacy preserving location information fusion based on linear combination aggregation and extend it for its use in CPSS ensuring the privacy of anchor's locations and dimensions, and target's location while roaming in CPSS environment. Furthermore, a privacy-preserving secure localization scheme is offered, together with the necessary cryptographic support to ensure the ultimate aim of privacy. In CPSS contexts where real-time location information is crucial for participant's safety, the proposed privacy-preserving secure localization scheme can be implemented. The proposed scheme is assessed through the implementation of a trustworthy personalized consumer recommendation system. The experimental results demonstrate that the proposed method can guarantee high recommendation accuracy and achieve the accuracy and diversity of personalized recommendations under varying recommendation list lengths when compared to other reliable methods for personalized consumer recommendations.

Title of Paper: Enhancing Smart Grid Security: An Data-Driven Anomaly Detection Framework.

Name of Conference: 2024 IEEE Conference on Communications and Network Security (CNS)

ISSN Number: 2994-5895

Names of Authors: Dr. Darshan V. Medhane

Abstract: The integration of Information and Communication Technologies (ICT) into traditional power grids has led to the evolution of smart grids, revolutionizing energy management. However, detecting anomalies within these systems remains challenging due to the complexity of potential events, ranging from cyber attacks to infrastructure faults and equipment malfunctions, compounded by the scarcity of labeled data. Addressing these challenges, this study presents a statistical data-driven framework for explainable anomaly detection in smart grid systems. The framework employs a Gaussian Mixture Model (GMM) to identify anomalous events without reliance on labeled data, followed by machine learning techniques to classify these anomalies into natural events or cyber attacks. Additionally, we utilize SHapley Additive exPlanations (SHAP) to explain the machine learning model's outputs, thereby enhancing the system's interpretability and explainability. Experimental results demonstrate the framework's efficacy, achieving 91% accuracy in anomaly detection and 90% in event classification. This approach not only enhances robustness and transparency in anomaly detection but also holds significant applicability for consumer electronics and cyberphysical systems.

3. Papers Presented by Students during October 2024: **NIL**
4. Industrial Training/Workshop done by Staff during October 2024:

Prof. Reena Johnson had successfully completed National Level One week Online Faculty Development Program on "Cyber Security: Advanced Concepts and Practices" from 21st to 25th October 2024 organized by Department of Information Technology in association with IOIT ACM Student Chapter, AISSMS Institute of Information Technology, Pune.

Dr. Darshan V. Medhane served as Reviewer 3rd IEEE International Conference on Blockchain and Distributed Systems Security 2024,held on October 17th -19th , 2024.Jointly Organized by BRACT's Vishwakarma Institute of Information Technology, Pune,IEEE Computer Society Pune Chapter and IEEE Pune Section, Maharashtra, India.

5. Industrial Visit/Field visit organized by department for student during October 2024: Nil

6. Training and Placement Cell during October 2024: **NIL**

7. Books Purchased in Central Library during Octoberr 2024: **NIL**
8. Forthcoming event in the month Dec. 24 and Jan. 25:- **NIL**
9. Achievements:

HOD, IT