IcfaiTech Newsletter

Vol 17
Dec 2022

Highlights:

- Faculty Achievements
- Promoting IcfaiTech
- Campus Happenings
- Welcoming Faculty
IcfaiTech, Hyderabad fosters a milieu apt for intellectual enhancement with contemporary pedagogy, a research-oriented approach, and relevance-based practices. A glimpse of this vibrant erudite experience encompasses the newsletters I am delighted to present to our avid readers every month.

This month, milestones have been achieved. Our faculty members have enhanced their expertise, participated in webinars, were invited to deliver guest lectures, presented papers, and received awards. Our effervescent campus witnessed several events rejoiced by the students as well as the faculty. Further, we have welcomed prodigious faculty members to our IcfaiTech family, this month. The December chapter of the newsletter embodies the achievements of the faculty members, a peek into the life at our campus, and much more.

~ Dr. K.L. Narayana
Director, IcfaiTech, Hyderabad
Dr. Movva Pavani, Assistant Professor, Department of ECE received a certificate of appreciation for reviewing research articles.

Journal: Imaging Science Journal

Publishing House: Taylor & Francis for the Year 2022

Dr. Soumit Samadder Chaudhury, Assistant Professor, Department of ECE, presented a paper at the IEEE Microwave Antenna and Propagation Conference (MAPCON) 2022.

Date: 13th December 2022

Title: Independent Control Over the Passband of Bandpass Filter Based on Semi-Circular Mushroom Loaded Substrate Integrated Waveguide

Abstract: This paper presents a method to control the passband of a bandpass filter by independently varying the bandwidth (BW) and center frequency (CF) of the bandpass filter which is based on a circular substrate integrated waveguide (SIW) loaded with two cascaded
semi-circular mushroom resonators (ScMRs). The dimensions of two mushroom vias are varied within a range of 0.6 mm to affect the resonance frequency of the cascaded mushroom resonators and consequently shift the center frequency of the passband by more than 6.5% keeping the passband bandwidth undisturbed. The internal capacitive coupling between the two cascaded ScMRs across the slot gap is varied by changing the slot width by 0.3 mm, which consequently establishes a control over the passband bandwidth and changes the 3dB fractional bandwidth independently by more than 6.6%. A simulative study shows that the proposed filter occupying a compact area of $0.3\lambda_0 \times 0.3\lambda_0$ has the passband centered at 2.3 GHz with a minimum insertion loss of 0.7 dB.

Dr. Thokala Soloman Raju, Assistant Professor, Department of Physical Sciences and Dr T Shreecharan, Assistant Professor, Department of Physical Sciences published a research paper.
Abstract: In this paper, we study the controllable behavior of nonautonomous matter waves in different "smart" transient trap variations in the context of the cigar-shaped Bose-Einstein condensates. By utilizing a self-similarity transformation we reduce the nonautonomous Gross-Pitaevskii (GP) equation to the elliptic equation that admits soliton solutions. This procedure leads to a consistency equation which is in the form of Riccati equation. The connection between the Riccati and the linear Schrödinger equation, through the Cole-Hopf transformation, is exploited profitably here to introduce temporal trap variations. For our study, we explore the possibility of using one dimensional exactly solvable (ES) potentials and their newly constructed rational extensions, as functions of time to introduce interesting temporal trap modulations. The fact that the regular potentials and their rational extensions being
structurally different, leads to different temporal modulations. It is exhibited that the soliton behavior with respect to compression in both of these cases is quite different.

Dr. Thokala Soloman Raju, Assistant Professor, Department of Physical Sciences presented a paper at an international conference.

Name of the Conference: 6th Workshop on Optics and Photonics: Theory and Computational Techniques (OPTCT) 2022

Organizers: Indian Institute of Technology, Delhi
Dates: 26–27 December 2022
Title of the presentation: Butterfly-shaped and Dromion-like Optical Similaritons in Asymmetric Twin-core Waveguide
Abstract: Butterfly-shaped and dromion-like optical waves in a tapered graded-index waveguide (GRIN) with an external source are reported for the first time. The generalized nonlinear Schrödinger equation, which describes self-similar wave propagation in GRIN with variable group-velocity dispersion (GVD), nonlinearity,
gain, and source is investigated and analytical solutions for this dynamical system are obtained. Under certain physical conditions, we reduce the coupled nonlinear Schrodinger equations to single wave equation that aptly describes similariton propagation through asymmetric twin-core fiber amplifiers. The asymmetric twin-core fiber is composed of two adjoining, closely spaced, single mode fibers in which the active one is a tapered, graded-index nonlinear-fiber and the passive one is a step-index fiber. The physical effects affecting these waves are explicated in detail. The stability of dromion-like structures is analyzed when the GVD parameter is perturbed. We have observed oscillation structure exhibiting strong interference due to this applied perturbation. For a particular value of the modulation of the GVD parameter, the oscillation structure is transformed into two dromion-like structures. It indicates that the dromion-like structure is unstable, and the coherence intensity is affected by the modified perturbation parameter. We further demonstrate the phenomenon of unbreakable $\mathcal{PT}$ symmetry of these novel nonlinear waves for three explicit examples.
Dr. Rashmi Sahay, Assistant Professor, Department of Computer Science Engineering received a certificate of appreciation for participating in a workshop as a guest speaker.
Workshop Title: Internet of things, its security measures and advances in HCI applications
Organizers: IIT Mandi iHub and HCI Foundation
Date: 9th-10th December 2022

Dr. Movva Pavani, Assistant Professor, Department of ECE contributed as a reviewer of research articles for an international journal.
Journal title: International Journal of Advanced Computer Science and Applications (IJACSA) for the year 2021 and 2022

Dr. Movva Pavani, Assistant Professor, Department of ECE participated in the “Two Days FDP on Hands on Session on Open Source VLSI Tools (Online)”, organized by the School of Electronics Engineering VIT-AP University, Amaravati on 20th – 21st December, 2022.
Dr. A. Chandrasekhar, Assistant Professor, Department of Mechatronics attended a Faculty Development Programme.
FDP Title: Kinematic Analysis of Robot Mechanisms: Fundamentals
Organized by: Centre for AI, IoT, and Robotics, IIIT, Design and Manufacturing, Chennai
Date: 9-15th Dec

Dr. Pradosh Kumar Gantayat, Assistant Professor, Department of CSE has received a certificate of appreciation for reviewing the papers submitted in the 2nd international Conference on Advanced Network Technologies and Intelligent computing (ATIC-2022)
Organizer: Dept. of Computer Science, Banaras Hindu University, Varanasi, India
Conference Date: Dec 22-24.

Dr. Rashmi Sahay, Assistant Professor, Dept. of CSE successfully organized, and conducted workshop in IEEE ANTS 2022.
Workshop Title: FogPlat: Workshop on Fog Computing based Security Frameworks for IoT Botnet Attack Prevention and Detection
Date: 18th December 2022
Researchers and Academician in the field of network security, information security and data security.

Researchers working in the field of Cloud/Fog/Edge Computing for IoT Security and Privacy.

Researchers working in the field of Blockchain, AI driven Fog Computing based frameworks for Botnet analysis, detection, and prevention.

Researchers working in the field of vulnerability assessment of IoT networks against Botnet attack.

Adversarial attacks in data and security analytics of large scale constrained networks.

Brief Overview: The vision of the workshop was to create a forum of researchers in the field of Cloud Computing, Fog Computing, the Internet of Things (IoT), Industrial IoT, and Security. The workshop aimed to attract the following audience:

During the workshop in IEEE International Conference on Advanced Networks and Telecommunications Systems, there were three paper presentations from authors of BITS-Pilani, Hyderabad Campus, NIT Raipur, and Bennett University. Papers presented in the workshop will be published along with the main conference proceeding in IEEE xplore. Along with the three paper presentations, the workshop also had two talk sessions by Dr. Tanmay Bhowmik from PDEU, Gandhinagar and Dr. Rashmi.
Dr. Sirisha Potluri, Assistant Professor, Department of CSE published 2 book chapters.

1. Title: A Systematic Review of AI Privileges to Combat Widen Threat of Flavivirus
   Published in: Springer Nature-Ambient Intelligence in Health Care. Smart Innovation, Systems and Technologies

Abstract: In order to prevent the extraordinary spread of sickness caused by Flavivirus, the healthcare business as well as public health are working tirelessly. Individual lives have been affected, but mosquito-infested public locations have made a considerable influence on the general public's health. Site adaptability, climate change, and inadequate healthcare services and surveillance all contribute to the spread of the virus. The potential dangers of this virus, on the other hand, have been uncovered through extensive and ongoing research in the healthcare business. Modern healthcare facilities may benefit from the reasoning capabilities and ever-evolving analysis techniques provided by artificial intelligence. More conclusive findings have been demonstrated in the realm of AI applications in healthcare domains such as cancer, neurology, and cardiology. A number of research works have justified the use of AI-oriented algorithms for intelligently handling unstructured and huge healthcare data. When it comes to using artificial intelligence (AI) to identify, forecast, diagnose, and treat disease using data from public health and biological databases, the current effort aims to undertake an extensive
examination. There may be issues in integrating assistive technology into the current healthcare system, as well. Because of this review, we hope that by merging AI research with clinical and public health specialists, critical knowledge may be extracted from data in order to unchain the relevant information of Flavivirus disease from its chains.

2. Title: GPS-Based Route Choice Model for Smart Transportation System: Bringing Intelligence into Vehicular Cloud
Published in: Springer Science and Business Media Deutschland GmbH, Lecture Notes on Data Engineering and Communications Technologies
Abstract: An IoT-based intelligent performance evaluation strategy is anticipated to rationalize the communication among the vehicles, manage vehicle traffic, support vehicle drivers with privacy and safety, and provision significant applications for cloud users. GPS-based route choice model is substantial for handling the transportation complications of a big city, traffic engineering, and remote communication among vehicles. With this scenario in mind, we recommend a strategy to manage and evaluate the performance of the vehicular cloud. Different types of cloud services, storage mechanisms, resources, and information management are provided to the cloud users, commercial vehicles, emergency services, and disaster services through the vehicular cloud computing model. The performance of the vehicular cloud can be raised to meet the information requirements of the cloud users by using the proposed route choice model. The primary objective of the proposed model is to provide the finest traffic light control
method using GPS inputs and vehicular area networks. An accurate traffic flow approximation method in vehicular area networks is useful to expect the amount of obtainable computational resources within a roadway subdivision given the unplanned arrivals and departures for smart transportation systems by bringing intelligence into the dynamic vehicular cloud.

Dr. Sirisha Potluri, Assistant Professor, Department of CSE edited 2 books.
1. Title: Cloud Analytics for Industry 4.0
Published by: De Gruyter in Volume 6 in the series Smart Computing Applications 2022

About the book: This book provides research on the state-of-the-art methods for data management in the fourth industrial revolution, with particular focus on cloud based data analytics for digital manufacturing infrastructures. Innovative techniques and methods for secure, flexible and profitable cloud manufacturing will be gathered to present advanced and specialized research in the selected area.
- Review of cutting-edge technologies to fill the research gaps in industrial data, analytics, people and processes.
- Advanced algorithms are mined to step forward in cloud manufacturing.
2. Title: Reconnoitering the Landscape of Edge Intelligence in Healthcare
Published by: CRC Press, Taylor & Francis Ltd

About the book: Reconnoitering the Landscape of Edge Intelligence in Healthcare provides comprehensive research on edge intelligence technology with the emphasis on application in the healthcare industry. It covers all the various areas of edge intelligence for data analysis in healthcare, looking at the emerging technologies such as AI-based techniques, machine learning, IoT, cloud computing, and deep learning with illustrations of the design, implementation, and management of smart and intelligent healthcare systems. Chapters showcase the advantages and highlights of the adoption of the intelligent edge models toward smart healthcare infrastructure. The book also addresses the increased need for a high level of medical data security while transferring real-time data to cloud-based architecture, a matter of prime concern for both patient and doctor. Topics include edge intelligence for wearable sensor technologies and their applications for health monitoring, the various edge computing techniques for disease prediction, e-health services and e-security solutions through IoT devices that aim to improve the quality of care for transgender patients, smart technology in ambient assisted living, the role of edge intelligence in limiting virus spread during pandemics,
neuroscience in decoding and analysis of visual perception from the neural patterns and visual image reconstruction, and more. The technology addressed include energy aware cross-layer routing protocol (ECRP), OMKELM-IDS technique, graphical user interface (GUI), IOST (an ultra-fast, decentralized blockchain platform), etc. This volume will be helpful to engineering students, research scholars, and manufacturing industry professionals in the fields of engineering applications initiatives on AI, machine learning, and deep learning techniques for edge computing.

Dr. Sirisha Potluri, Assistant Professor, Department of CSE attended EAI International Conference on Intelligent Systems and Machine Learning (EAI ICISML 2022) as the session chair. Organizer: Vardhaman College of Engineering, Hyderabad. Date: 16th-17th December 2022

Dr. Rashmi Sahay, Assistant Professor, Dept. of CSE has been appreciated for delivering a guest lecture during ATAL FDP on Industrial IoT: Security Issues, Challenges, and Solutions. FDP duration: 26th to 31st December 2022 (Online Session) Organizer: Methodist College of Engineering Lecture Title: Security in Industrial IoT Lecture Date: 27th December 2022
Dr. Rashmi Sahay, Assistant Professor, Dept. of CSE was invited to be the session chair in the 18th annual international conference on Information Assurance and Security (online).
Organizer: Machine Intelligence Research Labs (MIR Labs) - Scientific Network for Innovation and Research Excellence, Auburn, Washington, USA
Date: 14th December 2022

Vinay Kumar Goru, administrator, attended a 2 WEEK Faculty Development Programme.
FDP Title: Drone Imaging & AI/ML Tool for Improving Decision Making in Agriculture Applications
Organized by: AICTE Training and Learning (ATAL) Academy
Date: 05th December to 16th December 2022
Abstract: This paper presents a method to control the passband of a bandpass filter by independently varying the bandwidth (BW) and center frequency (CF) of the bandpass filter which is based on a circular substrate integrated waveguide (SIW) loaded with two cascaded semi-circular mushroom resonators (ScMRs). The dimensions of two mushroom vias are varied within a range of 0.6 mm to affect the resonance frequency of the cascaded mushroom resonators and consequently shift the center frequency of the passband by more than 6.5% keeping the passband bandwidth undisturbed. The internal capacitive coupling between the two cascaded ScMRs across the slot gap is varied by changing the slot width by 0.3 mm, which consequently establishes a
control over the passband bandwidth and changes the 3dB fractional bandwidth independently by more than 6.6%. A simulative study shows that the proposed filter occupying a compact area of $0.3 \lambda_0 \times 0.3 \lambda_0$ has the passband centered at 2.3 GHz with a minimum insertion loss of 0.7 dB.

The ICFAI Foundation for Higher Education Innovation & Entrepreneurship Council (IIEC) and Wadhwani Foundation jointly announced the launch of "NEN-IGNITE" - a pre-incubation program that is aimed at supporting start-up founders through a structured pathway from Idea Discovery to Pitch Deck.

The 14 week IGNITE program will offer 360° support to startups which includes:

- Dedicated mentorship
- One-on-one with program managers
- Digital content
- Live online workshops
- Weekly assignments and milestone evaluations
NEN-Ignite aims to empower professionals, and post-college, college, and pre-college innovators with the knowledge to transform ideas into real ventures. Through the innovatively designed program, budding entrepreneurs are provided with experiential, structured, and immersive skills to become successful entrepreneurs. Notable benefits of the program include access to online resources, case study-based concept sessions, and interactive online sessions.

Department of Computer Science and Engineering conducted departmental faculty seminars.

**Title:** Comparative Analysis of Machine Learning Models for Customer Segmentation  
**Speaker:** Dr. Rashmi Sahay, Assistant Professor, Dept. of CSE and Mr. Parmeshwar Joga  
**Date:** 8th December 2022  
**Abstract:** In the present competitive era, entrepreneurs struggle to increase and retain their customer base. Behavioural-based customer segmentation assists in the identification of potential customers, their buying habits, and shared interests. This helps to build an
efficient strategy to increase customer base and product sales. In this paper, we compare the efficacy of four machine learning algorithms, namely, KMeans, DBSCAN, Agglomerative Clustering, PCA with KMeans, in performing behavioural-based customer segmentation. The machine learning algorithms divide customers into an optimal number of customer segments based on parameter, namely, annual income, age, and spending score. The knowledge of customer segments based on the selected parameters will assist in exploring novel ways to increase marketing persona. Using the four algorithms, we group customers with common interests by extracting and analysing patterns in the available customer data. Our comparison shows that Agglomerative Clustering has the highest silhouette score of 0.6865 in performing behavioural-based customer segmentation in comparison to. The comparative analysis on feature-based customer segmentation explored in this paper can be used by organization for exploring efficient mechanisms for customer segmentation.
Title: Hyperspectral Image Classification
Speaker: Dr. B. Seetharamulu, Assistant Professor, Department of CSE
Date: 23rd December 2022

Abstract: Hyperspectral image classification (HSIC) on remote sensing imaging has brought immersive achievement using artificial intelligence technology. In Deep Learning Convolution neural networks (CNN), 2D-CNN, and 3D-CNN methods are widely used to classify the spectral-spatial bands of hyperspectral images (HSI). The proposed Hybrid 3D-CNN (H3D-CNN) model framework for deeper features extraction predicts classification accuracy in supervised learning. The model reduces the narrow gap between supervised and unsupervised learning and the complexity and cost of the previous models. The HSI classification analysis is carried out on real-world data sets of Indian pines Salinas datasets captured by Airborne visible, infrared imaging spectrometer (AVIRIS) sensors that performed superior classification accuracy results.
Department of Mathematics conducted a departmental faculty seminar.
Title: Double diffusive analysis on Maxwell fluid flow through a horizontal porous layer with effect of Soret and heat source
Speaker: Dr. Anjanna Matta, Assistant Professor, Department of Mathematics
Date: 29/12/2022
Abstract: A numerical study has been evaluated for the effect of Soret driven on a Maxwell fluid flow. The linear stability analysis of Maxwell fluid flow in a horizontal porous layer heated and salted from below is performed. By solving the eigenvalue problems, the critical Rayleigh number, wave number and different flow properties over stability are determined. For a better understanding the combined influence of Soret effect and heat source is investigated by using linear stability analysis. This thermal and solutal gradients are evaluated by applying shooting and Runga-Kutta method. The nature of study state velocity, temperature and concentration profiles are also studied with effect of Soret and heat source.
Dr. Soumit Samadder Chaudhury, Assistant Professor, ECE promoted IcfaiTech in Education Fair.
Event: Shiksha Mahotsav Agra
Location: Hotel Holiday Inn, Agra
Date: 10th - 11th December 2022
Candidates on 10th: 350
Candidates on 11th: 365

Dr. Sirisha Potluri, Assistant Professor, Department of CSE promoted IcfaiTech in Education Fair.
Event: Ferozepur global career fair 2022, Punjab
Organized by: BCM group of schools
Date: 10th - 11th December 2022
Dr. Sirisha Potluri delivered seminar on Artificial Intelligence and Machine Learning to +12 students in Ferozepur and Ludhiana
Dr. Ch. Leela, Assistant Professor and Head of the Department, Physical Sciences enlightened +2 level school students on advanced new age career options offered by IFHE at an educational fest.

**Event Title:** Career and Scholarship Fest 2022

**Organizer:** In association with iEducationalize at Bangalore.

**Venue:** Hosur Public School, Hosur, Bangalore

**Participation type:** Presentation on “New age careers”

**Co-participants:** ABBS-Bangalore, Vidyashilp-Bangalore, VIT, Universal group of Institutions, Vijaybhoomi, Alliance University, RV University, Krea University and Dayananda Sagar University.

**Number of students attended:**
- 19th Dec: 150
- 20 December 2022: 200
Overview: During the campaign, the faculty gave a presentation on “New age careers” for 12th standard students and promoted IFHE-Hyderabad (IcfaiTech), ICFAI Business School, ICFAI Law school and ICFAI School of architecture. Students studying in Hosur Public School, Hosur and Gyana Jyothi Public School, HAL Bangalore attended the presentation. After the presentation, students visited the stalls for counselling and guidance. Aspirants were provided with brochures and a demo of IcfaiTech/IBS based on their interests and concern for undergraduate education in Science and Engineering streams. The virtual campus tour is provided through oral presentation, video presentation and photographs.
Dr. Mallavarapu Sandhya, Assistant Professor, Dept. of ECE

Education:
- B.Tech in Electronics & Communications Engineering, Vignan’s Engineering College, Vadlamudi, Guntur 2009
- Doctoral Degree in National Institute of Technology Warangal 2016

Experience:
- Assistant Professor, SMITW, Guntur June 2010 to November 2011
- Assistant Professor, Chalapathi Institute of Technology, Guntur July 2013 to April 2017
- Adhoc faculty, Chalapathi Institute of Technology Warangal December 2017 to May 2018

Research:
- Area of Interest: Flexible, wearable multi-band antennas, the conformal and radiation safe wearable antennas for WBAN applications, Electromagnetic bandgap structures and defected ground structures loaded monopole antennas

Publications:
- more than 6 papers in reputed journals and presented several papers in international conferences

Membership:
- IEEE and MTTS

Dr. A. Sankar Ponnapalli, Assistant Professor, Dept. of ECE

Education:
- B.Tech in Electronics & Communications Engineering, JNT University Kakinada 2001
- Diploma in education technology and management, University of Hyderabad 2021
- M.Tech in RF & Microwave Engineering, GITAM (Deemed to be University) Visakhapatnam 2013
- Doctoral Degree in GITAM (Deemed to be University) Visakhapatnam 2018

Research:
- Area of Interest: microwaves, antennas, intelligent transportation systems, and engineering education technology etc.

Publications:
- authored or co-authored books, book chapters, and more than 60 research articles

Membership:
- reviewer and editorial board member for various international journals and conferences

Dr. Upendar Mendu, Assistant Professor, Dept. of Mathematics

Education:
- B.Sc. in Applied Mathematics, National Institute of Technology, Warangal 1998
- M.Sc. in Mathematics, National Institute of Technology, Warangal 2014

Experience:
- Lecturer, Thushara Post Graduate School of Information Science & Technology (JU), Warangal 1998-2001
- Assistant Professor, GITAM University, Hyderabad Campus 2013-2023

Research:
- Area of Interest: Data Science - Machine learning, Deep Learning, Fluid Mechanics - Micropolar and couple stress fluids, Convective heat and mass transfer - porous media, CFD, Nanofluids, Stability Analysis

Associate Professor in Institute of Technology and Science, Khammam 2006-2010