MARIAN
ENGINEERING COLLEGE

35th Annual State Convention of ISTE Kerala Section and National Seminar on 'Transformative Innovations Shaping the AI-Driven Epoch'

18th Jan. 2025, Saturday

MARIAN ENGINEERING COLLEGE
Kazhakuttom, Thiruvananthapuram

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Souvenir

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35th Annual State Convention of ISTE Kerala Section and National Seminar on Transformative Innovations Shaping the AI-Driven Epoch

18th January, Saturday

Marian Engineering College

Kazhakuttom, Thiruvananthapuram

GOVERNMENT OF KERALA

Pinarayi Vijayan

CHIEF MINISTER

No. 38/Press/CMO/25

07 January, 2025.

MESSAGE

I am happy to note that the Marian Engineering College, Thiruvananthapuram, is planning to bring out a souvenir as part of the 35th Annual Convention of the ISTE Kerala Section on 18th January, 2025.

I extend my good wishes to the annual convention and to the souvenir which is being brought out to mark this occasion.

Pinarayi Vijayan

141, 3rd Floor, North Block, Government Secretariat, Thiruvananthapuram Pin 695001 T 0471 2333241, 2333812, 2333610 F 0471 2333489
E chiefminister@kerala.gov.in facebook.com/cmokerala twitter.com/cmokerala
Residence Cliff House T 0471 2318406, 2314853
www.keralacm.gov.in

A. N. SHAMSEER
SPEAKER
KERALA LEGISLATIVE ASSEMBLY

LEGISLATURE COMPLEX
THIRUVANANTHAPURAM-695 033
Phone { Office : 91-471 2513007
91-471 2513035
91-471 2305830
Mobile : 9447056803
e-mail : speaker@niyamasabha.nic.in

Date.....*10.01.2025*

MESSAGE

It is a pleasure to know that Marian Engineering College is hosting the 35th Annual State Convention of the ISTE Kerala Section. Transfonnative technologies are essential to achieve rapid progress in business and industry. Artificial Intelligence helps to reduce redundancy in jobs and inspires human resources to explore new avenues for growth and innovation. Marian Engineering College's efforts in embracing phenomenal changes in education and scientific technology are very much appreciated.

I wish this endeavour all success.

A. N. SHAMSEER

Residence : Neethi, Legislature Complex, Thiruvananthapuram-695 033
Phone : 91-471 2513014

Dr. R. BINDU
MINISTER FOR
HIGHER EDUCATION & SOCIAL JUSTICE
GOVERNMENT OF KERALA

Thiruvananthapuram

Date: 10/01/2025

MESSAGE

I am pleased to extend my heartfelt greetings to the organizers and participants of the 35th Annual State Convention of the ISTE Kerala Section and the National Seminar on "Transformative Innovations Shaping the AI-Driven Epoch;' hosted by Marian Engineering College, Trivandrum.

The chosen theme highlights the crucial role of artificial intelligence in transforming education, research, and industry. As we enter an AI-driven future, events like this provide an invaluable platform for educators, researchers, and students to explore groundbreaking innovations and their societal impacts. I believe this seminar will foster collaboration, spark new ideas, and pave the way for transformative advancements in higher education.

I also commend the publication of the souvenir, which will serve as a meaningful record of the event's achievements and a source of inspiration for future endeavors in academia and technology.

My sincere congratulations to Marian Engineering College and the ISTE Kerala Section for organizing this significant event. I wish the convention and seminar great success in achieving their goals.

Love and Regards

Dr. R. Bindu

Office : Room No. 301, Annexe-II
Government Secretariat, Thiruvananthapuram-695 001
Phone-Office : 0471-2327574 Res. : 0471-2334133 Mobile : 9447741385
E-mail : r.bindu@kerala.gov.in, minhednsjd@gmail.com

V. D. SATHEESAN
LEADER OF OPPOSITION
KERALA LEGISLATIVE ASSEMBLY

Date: 10/01/2025

MESSAGE

It gives me great pleasure to extend my heartfelt greetings to the organizers, participants, and supporters of the 35th ISTE State Convention of the Kerala Section which is being held at Marian Engineering College Trivandrum.

Kerala has always been at the forefront of educational excellence, with a tradition of embracing new ideas and technologies. The efforts of the ISTE Kerala Section in nurturing talent, promoting professional growth, and addressing the challenges of the ever-evolving technical landscape are truly commendable.

I extend my best wishes for the convention's success and its continued contributions to the field of technical education.

V.D. Satheesan

Cantonment House, Vikas Bhavan P. O., Thiruvananthapuram-695 033
Phone-Office : 0471-2318330, 2512050 Fax : 0471-2315625 Res. : 0484-2449500
Mobile : 9447018183 E-mail : oppositionleaderkerala@gmail.com

ADDITIONAL SKILL ACQUISITION PROGRAMME

A Government of Kerala Undertaking

MESSAGE

I extend my heartfelt congratulations to Marian Engineering College, Trivandrum, for hosting the 35th ISTE Annual State Convention of Kerala Section on 18th January 2025. The inclusion of a National Seminar on "Transformative Innovations Shaping the AI-Driven Epoch" as part of the convention is both timely and commendable, reflecting the institution's commitment to addressing the technological advancements shaping our world today.

Artificial Intelligence has emerged as a transformative force across industries redefining the future of work, education, and innovation. Events like these serve as vital platforms for fostering dialogue, exchanging ideas and inspiring the academic community and industry leaders to collaborate in creating sustainable, inclusive and needy solutions to leverage AI for the betterment of society. Bringing together experts, academicians and young minds to deliberate on transformative innovations is a significant step towards equipping Kerala's workforce with the skills and knowledge needed to thrive in an AI-driven era.

My best wishes to the organizers, speakers and participants for a successful and impactful convention.

Dr. Usha Titus IAS
Chairperson and Managing Director
Additional Skill Acquisition Programme (ASAP), Kerala

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MESSAGE

I am delighted to extend my warm greetings to the organizers, participants, and distinguished guests of the 35th ISTE Annual State Convention of Kerala Section, hosted by Marian Engineering College, Trivandrum, on 18th January 2025.

This convention stands as a testament to the unwavering commitment of the Indian Society for Technical Education (ISTE) to advancing knowledge and fostering innovation in the field of technical education. By creating a platform for educators, researchers, and industry professionals to collaborate and exchange ideas, the ISTE continues to empower the academic community to adapt to the rapidly evolving technological landscape.

The theme of this year's National Seminar, "Transformative Innovations Shaping the AI-Driven Epoch," could not be more relevant in today's era of groundbreaking technological advancements. Artificial Intelligence is revolutionizing industries, reshaping economies, and redefining how we live and work. As educators, it is our responsibility to ensure that our institutions remain at the forefront of this transformation, equipping students with the skills and mindset necessary to lead in this AI driven age.

I commend Marian Engineering College for its dedicated efforts in organizing this prestigious convention and seminar. The college's proactive initiatives to engage with emerging technologies and foster a culture of innovation are truly commendable.

Let this event inspire all participants to embrace transformative innovations and cultivate a forward thinking approach to education and research. Together, we can create a future that harmoniously blends technological progress with societal well-being.

I extend my best wishes to the organizers for a successful convention and seminar. May this gathering ignite ideas, foster collaborations, and set the stage for transformative strides in technical education.

Warm Regards,

Dr. Shalij P R
Director of Technical Education
Government of Kerala

OFFICE OF THE DIRECTOR OF TECHNICAL EDUCATION
KERALA STATE
Thiruvananthapuram
Pin - 695 023

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INDIAN SOCIETY FOR TECHNICAL EDUCATION

(Under the Societies' Registration Act XXI of 1860)

ISTE

DR. PRATAPSINH K. DESAI
President

MESSAGE

It gives me immense pleasure to know that ISTE Kerala Section is organizing the 35th Annual Convention on January 18, 2025 at Marian Engineering College, Thiruvananthapuram, Kerala and a National Seminar on "**Transformative Innovation Shaping the AI-Driven Epoch**" and releasing a Souvenir to mark the occasion.

I am sure that the mega event would provide an excellent platform to researchers, academicians, scientists and engineers to discuss various issues relating to the system of higher education in the country and marked by rapid technological advancements and a global shift towards digitalization, Artificial Intelligence (AI) technology emerges as a pivotal force in redefining the paradigms of growth and innovation.

I extend my wholehearted wishes for the Convention and wish all the participants on this occasion.

07/01/2025 **(DR. PRATAPSINH K. DESAI)**

SHAHEED JEET SINGH MARG, NEAR KATWARIA SARAI, NEW DELHI - 110016
☎ - 91 11 2651 3542, 2651 4234, ✉ : istedhq@isteonline.org, 🌐 : www. isteonline.in
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INDIAN SOCIETY FOR TECHNICAL EDUCATION

(Under the Societies' Registration Act XXI of 1860)

ISTE

Dr. S.M. Ali
Executive Secretary

MESSAGE

It is a matter of great pleasure that ISTE Kerala Section is organizing the 35th Annual Convention and National Seminar on "**Transformative Innovation shaping the AI-Driven Epoch**" on January 18, 2025 at Marian Engineering College, Thiruvananthapuram, Kerala and releasing a Souvenir to commemorate the event.

I am sure that the Convention will be a memorable and rewarding experience for all the Students and faculties coming from different parts of the nation and the Seminar will feature distinguished speakers who will share valuable insights into transformative technologies and their impact on the future.

I send my best wishes to the Students, Faculty and organizers of the Convention on this occasion and hope that the deliberations of the Convention will lead to concrete recommendations for the growth of the technical education in the country in the right perspective.

I wish the Convention a grand success.

Dr. S.M. Ali
Executive Secretary

07/01/2025

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(Under Societies Registration Act XXI of 1860)

KERALA SECTION

Near Power House Junction, Viyyur, Thrissur 680 010.
Ph : 8330030235, 9447163848, Email : istekeralahq@gmail.com

Dr. K Vijayakumar
Chairman, ISTE Kerala Section

Message

It is a matter of immense pleasure that the Marian Engineering College, Thiruvananthapuram is hosting the **"35th Annual Faculty Convention of the ISTE Kerala Section"** and organizing a **"National Seminar on Transformative Innovations Shaping AI-Driven Epoch"** on January 18, 2025 as part of the convention.

Artificial Intelligence (AI) has emerged as a transformative force, reshaping industries and redefining global economic landscapes. AI-driven technologies, such as machine learning, natural language processing, and robotics, are enhancing operational efficiency, fostering creativity, and driving sustainable economic growth. By leveraging AI responsibly, industries can achieve unprecedented levels of productivity and adaptability in an increasingly competitive global economy.

I am quite sure that the seminar will facilitate the participants to explore and share various novel ideas through research presentations and keynote addresses on Artificial Intelligence. I am using this opportunity to congratulate the management, principal, faculty, staff, and students of the institution for taking up the responsibility of hosting the **35th annual faculty convention of the ISTE Kerala Section,** and wish all the best for the national seminar and publication of the souvenir.

Dr. K Vijayakumar
Chairman, ISTE Kerala Section

Chairman :- Dr. K. Vijayakumar Mob : 9446419835 Email : vij_kk@rediffmail.com
Secretary :- Prof. E.C. Ramakrishnan Mob : 9447528666 Email : ecramakrishnan@gmail.com
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Latin Archdiocese of Trivandrum

no. MS/AB-2025/002

Dated: 13.01.2025

MESSAGE

I am delighted that Marian Engineering College is hosting the 35th ISTE Annual State Convention of the Kerala Section. This remarkable event, along with the National Seminar on "Transformative .Innovations Shaping the AI-Driven Epoch," reflects the institution's commitment to fostering academic excellence and meaningful dialogue on emerging technologies.

I extend my heartfelt appreciation to the organizing team for their dedication and meticulous efforts in conducting this convention, which brings together great minds to explore innovative solutions for the betterment of society.

May this event inspire all participants to embrace innovation and collaboration in their pursuits. I wish the convention and seminar a great success.

Prayers and Blessings,

Yours in Jesus and Mary,

† Thomas J. Netto
Archbishop ofTrivandrum

Archbishop's House, Vellayambalam, P.B.No. 805, Thiruvananthapuram - 695 003, Kerala, India
Tel:0091-471-2724001, 2, 3, 4, Fax: 0091-471-2725001 Email: archbishoptrivandrum@gmail.com Web: www.latinarchdiocesetrivandrum.org

MARIAN
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Thiruvananthapuarm, Kerala, India -695582
Tel: +91-471-2707111, 9495707111, 9495707222
www.marian.ac.on: Email: mail@marian.ac.in

MESSAGE

It is with immense pride and joy that Marian Engineering College hosts the 35th ISTE Annual State Convention of the Kerala Section. I extend my heartfelt gratitude to the ISTE Kerala Section for entrusting us with this prestigious event, which serves as a platform for intellectual exchange and collaboration among academicians, researchers, and professionals.

The National Seminar on *"Transformative Innovations Shaping the AI-Driven Epoch,"* organized in connection with the convention, holds profound relevance in today's rapidly evolving technological landscape. This seminar provides a unique opportunity to explore the immense potential of artificial intelligence and its transformative impact on society. I am certain that the discussions and deliberations will inspire innovative solutions and pave the way for advancements in engineering and technology.

I also take this opportunity to appreciate the release of the souvenir, which captures the vision and essence of this grand event. This thoughtfully curated publication will serve as a valuable keepsake, highlighting the collective efforts and achievements of everyone involved.

My sincere appreciation goes to the organizing team for their meticulous planning, dedication, and tireless efforts in making this event a resounding success. Your commitment reflects the values of Marian Engineering College and our unwavering pursuit of academic excellence.

As we celebrate this gathering of minds and ideas, let us reaffirm our commitment to fostering innovation, collaboration, and a shared vision for a brighter future. I wish the convention and seminar great success and hope it leaves a lasting impact on everyone who participates.

Rev. Dr. A R John
Manager

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Thiruvananthapuarm, Kerala, India -695582
Tel: +91-471-2707111, 9495707111, 9495707222
www.marian.ac.on: Email: mail@marian.ac.in

MESSAGE

Marian Engineering College is privileged to host the 35th ISTE State Convention of Kerala Section and a National Seminar on "Transformative Innovations Shaping the AI-Driven Epoch." This event underscores our commitment to academic excellence and cultivating a vibrant intellectual atmosphere. We believe this convention will provide a valuable platform for knowledge sharing, collaborative research, and networking amongst esteemed academics, industry professionals, and aspiring young minds. We extend our heartfelt gratitude to all participants, delegates, and most sincerely to the dedicated organizing committee whose tireless efforts have made this event possible. Their meticulous planning and unwavering commitment have ensured a smooth and enriching experience for all.

Warm Regards
Fr. Jim Carvin Roach
Bursar

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ENGINEERING COLLEGE
Minority Institution Run by Latin Archdiocese of Trivandrum

Thiruvananthapuarm, Kerala, India -695582
Tel: +91-471-2707111, 9495707111, 9495707222
www.marian.ac.on: Email: mail@marian.ac.in

MESSAGE

It is with immense pride and satisfaction that we, at MEC, have the honor of hosting the 35th ISTE Annual Convention of the Kerala Section. This is a momentous occasion for all of us, and the National Seminar on "Transformative Innovations Shaping the AI-Driven Epoch," which will be conducted as part of the convention, adds an invaluable dimension to this event.

The Indian Society for Technical Education (ISTE) has long been at the forefront of advancing technical education in India. Through its conferences, workshops, seminars, and competitions, ISTE helps enhance the skills of students and educators in engineering and technology. The society also supports professional development programs and fosters research and innovation, playing a key role in bridging the gap between academia and industry while shaping future technologists and leaders.

The Annual State Convention of ISTE holds significant value in the larger context of technical education, as it provides a platform for exchanging ideas, best practices, and emerging trends in the field. Through such initiatives, ISTE is playing a crucial role in shaping the future of education and empowering the next generation of innovators and professionals.

As we gather for this convention, I encourage all participants to take full advantage of the opportunities to learn, share knowledge, and engage with experts from various fields. I am confident that the insights, discussions, and connections formed during this event will leave a lasting impact on everyone involved and further elevate the quality of technical education in Kerala and beyond.

This convention will undoubtedly be remembered as a significant milestone in the history of MEC, and I wish the event great success. May it inspire continued collaboration, innovation, and excellence in the years to come.

Dr. Abdul Nizar M
Principal

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Thiruvananthapuarm, Kerala, India -695582
Tel: +91-471-2707111, 9495707111, 9495707222
www.marian.ac.on: Email: mail@marian.ac.in

MESSAGE

As the Dean of Marian Engineering College it is with great pride and enthusiasm I welcome all delegates and invited guests to the 35th Annual State Convention of the ISTE Kerala Section.

This gathering represents a unique platform to foster collaboration, exchange innovative ideas, and drive advancements in technical education. It is a testament to our shared commitment to nurturing talent, embracing emerging technologies, and addressing the challenges of a rapidly evolving world. As we stand at the forefront of an AI-driven future, it is imperative to embrace technologies that not only redefine industries but also foster sustainable growth, inclusivity, and ethical progress.

Together, we can create a lasting impact on the academic and industrial ecosystem. Wishing you all a fruitful and memorable experience at this 35th Annual State Convention of the ISTE Kerala Section at Marian EduCity.

Dr. Samson A
Dean

MARIAN
ENGINEERING COLLEGE
Minority Institution Run by Latin Archdiocese of Trivandrum

Thiruvananthapuarm, Kerala, India -695582
Tel: +91-471-2707111, 9495707111, 9495707222
www.marian.ac.on: Email: mail@marian.ac.in

MESSAGE

Marian Engineering College is organizing on 18th January 2025, the 35th ANNUAL State Convention of the ISTE Kerala Section as well as the National Seminar on "Transformative Innovations Shaping the AI-driven Epoch. This is also a very proud 25th year of Excellence for the College whose motto is to "Nurturing a Habit of Excellence". The National Seminar is also very timely and relevant at a time when the world is undergoing AI driven transformation. Being a Life member of ISTE for last 35 years, I am very happy this is taking place at Marian Engineering College. MEC has been doing commendable work in student empowerment, quality education, lifelong professional growth through the ISTE chapter as well as encouraging innovation and research. Wish all successes for the event and future endeavors.

Dr Narayanan S
Professor, Civil Department, Marian Engineering College
President, Institute Innovation Council

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SNRWA-32, Subash Nagar,Perunthanni, Thiruvananthapuram.
Tel: 0471-2507073, +91 8129998229 mailtvm@gcsindia.in

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35th ANNUAL STATE CONVENTION OF ISTE KERALA SECTION AND NATIONAL SEMINAR ON TRANSFORMATIVE INNOVATIONS SHAPING THE AI-DRIVEN EPOCH

18th January 2025

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INDIAN SOCIETY FOR TECHNICAL EDUCATION (ISTE)

ABOUT US

About ISTE

The Indian Society for Technical Education (ISTE), established in 1968, is a premier national organization dedicated to enhancing the quality of technical education in India. With over 1,30,000 teacher members from various institutions and more than 5,00,000 student members, ISTE fosters innovation, research, and professional development in engineering, technology, and applied sciences, empowering educators and students alike. Major institutions with ISTE chapters include IITs, NITs, IISc, and numerous leading engineering and technical colleges across India.

Key Objectives

- Professional Growth: Promote continuous learning and skill enhancement for educators and technical professionals.
- Student Empowerment: Offer platforms for students to engage in innovative projects, technical competitions, and leadership activities.
- Quality Education: Enhance the teaching-learning process through training programs, work shops, and curriculum improvement initiatives.

Activities and Contributions

- Organizing national-level conventions, seminars, and conferences to share knowledge and explore advancements in technology.
- Conducting faculty development programs (FDPs) and short-term training sessions.
- Encouraging research and innovation by providing grants and recognitions.
- Publishing high-quality journals and technical magazines to disseminate knowledge.
- Fostering collaboration between academia and industry through partnerships and internships.

Global Presence and Affiliations

ISTE is associated with international organizations in technical education, enabling global exposure and opportunities for its members.

ISTE's contributions significantly impact India's educational landscape, making it a key driver in shaping the future of technical education and professional development.

MARIAN
ENGINEERING COLLEGE
Thiruvananthapuarm, Kerala, India -695582
Tel: +91-471-2707111, 9495707111, 9495707222
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About MEC

The Marian Engineering College (MEC) Kazhakuttom, Trivandrum is managed by the Trivandrum Social Service Society under the Trivandrum Latin Catholic Archdiocese. College located in the serene city of Trivandrum, Kerala, is a premier institution established in 2001. Affiliated with APJ Abdul Kalam Technological University and approved by the All India Council for Technical Education (AICTE), MEC offers a comprehensive range of undergraduate and postgraduate programs in engineering and technology.

The college is known for its commitment to academic excellence, fostering a nurturing environment that encourages innovation and research. With a faculty comprising experienced professionals and experts in their fields, MEC ensures that students receive high-quality education and guidance, preparing them for the challenges of the dynamic engineering landscape.

Apart from academics, MEC encourages the holistic development of students. The college offers numerous extracurricular activities such as sports, cultural events, and technical clubs, which help students build leadership skills, teamwork, and a sense of social responsibility.

Vision

To be an institution offering quality technical education and promoting research with strong ethical values for public good.

Mission

To mould the young men and women into technologically up to date, socially conscious and morally sound individuals by providing an inspiring environment of learning for the welfare of the society.

INDIAN SOCIETY FOR TECHNICAL EDUCATION
(Under Societies Registration Act XXI of 1860)
KERALA SECTION
Near Power House Junction, Viyyur, Thrissur 680 010.
istekeralahq@gmail.com, istekerala@gectcr.ac.in
8078960508

ISTE KERALA

ISTE KERALA SECTION ANNUAL REPORT 2023 -2024

Prof. E. C. Ramakrishnan
Secretary ISTE Kerala Section

I. INTRODUCTION

The Indian Society for Technical Education (ISTE) is the leading National Professional non-profit-making Society for the Technical Education System in our country with the motto of Career Development of Teachers and Personality Development of Students and overall development of our Technical Education System. Being the only national organization of educators in the field of Engineering and Technology, ISTE effectively contributes in various missions of the Union Government. The strength of ISTE is the strong base it has in technical education institutions in the country. At present, the ISTE has a very large and an effective membership base consisting of 124024 Life Members, 5lakh Student members, 2734 Institutional Members, 1369 Faculty Chapters, 1479 Student Chapters at institutional level and 17 Sections at State level.

The major objective of the ISTE is to provide quality training programmes to teachers and administrators of technical institutions to update their knowledge and skills in their fields of activity and to assist and contribute in the production and development of top-quality professional engineers and technicians needed by the industry and other organisations.

It organizes an annual convention for faculty and students separately every year where a large number of technocrats, technical teachers, policymakers, experts from the industry, etc. participate and interact. Every year a National Seminar with a specific theme with respect to the latest development in the field of Science and Technology and societal problems is being arranged during the Annual convention and leading luminaries of technical education is invited to deliver special lectures and delegates will present research papers.

ISTE Kerala Section is one of the oldest in the country and has been very vibrant from the day of its inception. Many of the programs initiated by the section have been duplicated by other sections. ISTE Kerala Section has 136 institutional members, 90 faculty chapters, 91 student chapters,7161 life members and 30273 student Members as on August 2023.

II. SECTION MANAGEMENT COMMITTEE

The activities of the Kerala section were managed by the section management committee (SMC) consisting of the following members:

Chairman	:	Dr. K. Vijayakumar.
Secretary cum Treasurer	:	Prof. E. C. Ramakrishnan.
National Executive council members	:	Prof. (Dr)Sunil Kumar. C.P.
	:	Dr. Shalij P.R.
	:	Prof.Shamsudheen V.A.
	:	Prof. Subair .P.
	:	Dr. Nidhi M. B.
	:	Prof. (Dr) Muruganantham.P.
SMC members	:	Dr. Anil. B.
	:	Dr. RajanNambiar. P. T.
	:	Prof. Jayakumari.V.
	:	Dr. Sreejith.C.C.
	:	Prof.Asokan O.V.
	:	Prof. Biju M. J.

III. SECTION MANAGEMENT COMMITTEE (SMC) MEETINGS

The Section Management Committee met 5 times during the reporting period. ie 1st September 2023 to 31st August 2024.

1. SMC meeting on 02-09-2023
2. SMC meeting on 23-12-2023
3. SMC meeting on 20-01-2024
4. SMC meeting on 09-06-2024
5. SMC meeting on 10-08-2024

IV. MEMBERSHIP DETAILS

The membership of the Kerala section has been steadily increasing and the present membership details are as follows. It was steadily increasing manner.

Category	*Membership strength*						
	Aug**2017**	Aug**2018**	Aug2019	Aug**2020**	**Aug.2021**	**Aug.2022**	Aug**2023**
Institutional Members (IM) Degree level	105	108	108	106	107	107	109
Diploma Level	24	25	25	30	32	32	35
Total	**129**	**133**	**133**	**136**	**139**	**139**	**144**
Faculty Chapters	85	86	88	89	90	90	90
Students' Chapters	76	80	80	81	83	89	91
Life Members 6508	6621	6763	6836	7010	7114	7161	
Student Members	26735	24658	22507	21529	23135	26931	30273

V. MAJOR ACTIVITIES

1. ANNUAL GENERAL BODY MEETING (AGM)

The 33rdAnnual General Body meeting was held at Federal Institute of Science and Technology (FISAT), Angamaly. Kerala. at 2:30 pm on 20thJanuary 2024. Dr. K. Vijayakumar, Chairman, ISTE Kerala Section presided. Chairman welcomed the gathering and briefed on the activities of the section. Prof. E.C. Ramakrishnan, Secretary cum Treasurer, ISTE Kerala presented the annual report and account statements. Both were approved by AGM.

2. 34th ISTE ANNUAL STATE FACULTY CONVENTION & NATIONAL SEMINAR

The 34th Annual Faculty Convention of the ISTE Kerala Section was held on 20th January 2024 at Federal Institute of Science and Technology (FISAT), Angamaly. Kerala. The annual faculty convention was inaugurated by the Honourable Vice Chancellor of APJ Abdul Kalam Technological University, Dr.Saji Gopinath. Honourable chairman of ISTE Kerala section, Dr. K Vijayakumar, presided over the inaugural function.

Dr. Saji Gopinath inaugurating the 34th annual faculty convention

Dr. Thomas Jacob V, Principal FISAT welcomed the gathering of participants of the 34th annual convention. Dr. Mini P R, Vice Principal, FISAT & organizing chairman gave a glimpse on the convention proceedings.

Dr. Saji Gopinath, Vice Chancellor of APJ Abdul Kalam Technological University, underscored the pivotal role of faculty members in the age of Artificial Intelligence (AI). He eloquently elaborated on the significance of AI across diverse engineering disciplines.

Dr. Lizy Abraham, Principal Investigator of WESAT (Women-Engineered Satellite) delivered the keynote lecture on Artificial Intelligence for Edge devices. Dr. Lizy Abraham provided invaluable insights into the challenges and opportunities inherent in leveraging AI foredge devices, addressing critical aspects such as resource constraints, latency considerations and scalability issues.

Prof. E. C. Ramakrishnan, Secretary cum Treasurer of ISTE Kerala section distributed the awards to the best performing institutions and faculty members during the function. Dr. Asha Joseph, Secretary cum Treasurer of FISAT & organizing secretary of the 34th annual faculty convention proposed the vote of thanks for the inaugural function. 18 Technical paper presentations were held in four parallel sessions. Two experts in the area of Artificial Intelligence chaired each session. About 250 participants from various engineering colleges and polytechnic colleges across the state attended the convention. Annual General Body meeting of the ISTE Kerala section was held in the afternoon. Prof. E.C Ramakrishnan presented the annual report in the annual general body meeting. Also, the financial statement was presented and discussions were carried out. The convention has concluded at 4.00 pm.

FISAT receiving the best chapter award from Honourable Vice Chancellor of APJ Abdul kalam Technological University Dr. Saji Gopinath

3. 22nd ANNUAL STATE STUDENTS' CONVENTION OF ISTE KERALA SECTION

The 22nd Annual State Students' Convention of ISTE Kerala section, named ATHENA, was inaugurated with great enthusiasm at TKM College of Engineering, Kollam. The event, which took place on March 16 and 17, 2024, featured a diverse range of engaging activities, including technical paper presentations, project exhibitions, workshops, and guest lectures by prominent industry figures. The inauguration ceremony was a grand affair, graced by esteemed personalities from the academic and industrial sectors. Dr. Jessin TA, the Organizing Secretary & Faculty Advisor of ISTE TKMCE Chapter, along with Dr. K. Vijayakumar, Chairman of ISTE Kerala Section and Mr. Terrance Alex, CEO of Watt sun Energy India Pvt Ltd were among the distinguished guests present. Additionally, Prof E.C. Ramakrishnan, Secretary cum Treasurer of ISTE Kerala Section, Dr.B Anil, Former Chairman ISTE Kerala Section, Principal (Rtd) of Govt. Engineering College Barton Hill, Trivandrum, and Dr.Nidhi M B, Professor of Mechanical Engineering at Mar Baselios College of Engineering, Trivandrum, added to the eminent gathering. The ceremony marked the beginning of an event that promise to foster innovation, collaboration, and knowledge sharing among students and professionals in the field of engineering among students.

The sole purpose of the fest was the fabrication of an atmosphere of fun-filled technical education. Athena concentrated on enhancing not only the technical skill set of students, but also their soft skills and their ability to think critically in order to advance in a competitive world. The most rewarding aspect of the entire planning process was hearing the participants' heartfelt and gratifying responses. The event overall resulted in a fruitful outcome and urged the students to expand their skill set and mould their talent in a more futuristic way.

ISTE KERALA SECTION AWARDS 2022-23

FACULTY CHAPTER AWARD 2022-23

1. Best ISTE Faculty Chapter Award 2022-23 (Engineering College Stream):
   Federal Institute of Science and Technology, Angamali
2. Best ISTE Faculty Chapter Award 2022-23 (Polytechnic Stream):
   JDT Islam Polytechnic College, Vellimadukunnu, Kozhikode.

BEST FACULTY ADVISOR AWARD 2022-2023
(ENGINEERING COLLEGE STREAM)

- *Best Faculty Advisor Award 2022-2023:*
  Dr. AHAMMED MUNEER K V
  Associate Professor
  Government Engineering College, Wayanad.
- *Special Appreciation Award 2022-2023:*
  Sri. RAMANAND.A. C.
  Asst Professor
  Government College of Engineering, Kannur
- Special Appreciation Award 2022-2023:
  Smt. ASHA.S.
  Associate Professor, Mar Baselios College of Engineering and Technology, Thiruvananthapuram.

BEST FACULTY ADVISOR AWARD 2022-2023
(POLYTECHNIC COLLEGE STREAM)

- *Best Faculty Advisor Award 2022-2023:*
  Smt. RUKSANA.T. P.
  JDT ISLAM Polytechnic College Vellimadukunnu, Kozhikode.

STUDENT CHAPTER AWARD 2022-2023
(ENGINEERING COLLEGE STREAM)

- *Best Students' Chapter Award 2022-2023*
  Government Engineering College, Barton Hill, Trivandrum
- *Best Students' Chapter with Maximum Number of Activities Award 2022-23*
  Government College of Engineering, Dharmasala, Kannur
- *Best Students' Chapter with Maximum Number of Variety Programmes Award 2022-2023*
  TKM College of Engineering, Karicode, Kollam.
- *Emerging Students' Chapter Award 2022-2023*
  Government Engineering College, Mananthavady, Wayanad
- *Students' Chapter -Special Appreciation Award 2022-2023*
  Government Engineering College, West Hill, Kozhikode.
- Special Appreciation Award for Successfully Conducting The 21st Annual Students 'convention of ISTE Kerala Section
  Government Engineering College, Ramavarmapuram, Thrissur.

STUDENT CHAPTER AWARD 2022-2023
(POLYTECHNIC COLLEGE STREAM)

- *Best Students'Chapteraward 2022-2023*
  JDT ISLAM Polytechnic College, Vellimadukunnu, Kozhikode
- *Emerging Students' Chapter Award 2022-2023*
  Malabar Polytechnic Campus, Cherpulassery, Palakkad.

BEST STUDENTS AWAREDS 2022-2023

- **HRIDHYA RAJESH V**
  Electrical and Electronics Engineering
  Government Engineering College, Barton Hill, Thiruvananthapuram
- **DEVIKA SUJITH**
  Computer Science & Engineering
  TKM College of Engineering, Kollam
- **VYSHNA M**
  Civil Engineering
  Government College of Engineering, Kannur
- **AMALKRISHNA K J**
  Civil Engineering
  Vidya Academy of Science & Technology Thalakottukara, Thrissur
- **VYSHNAVI K P**
  Civil Engineering
  Jyothi Engineering College, Cheruthuruthi, Thrissur
- **ABDULLAH RISHAD**
  Production Engineering
  Government Engineering College, Thrissur
- **ROHAN U S**
  Electrical And Electronics Engineering
  Mar Baselios College of Engineering and Technology Thiruvananthapuram
- **ARYAKRISHNA V R**
  Chemical Engineering
  Government Engineering College, West Hill, Kozhikode
- **ANWAR SADATH K Y**
  Computer Science & Engineering
  Thejus Engineering College, Vellarakkad, Thrissur
- **SNEHA G**
  Electronics And Instrumentation Engineering
  Federal Institute of Science and Technology (FISAT) Angamaly, Eranakulam
- **SHIRIN ZIBA C T**
  Electrical And Electronics
  Engineering Government Engineering College Mananthavady, Wayanad.
- **MUHAMMED BIN NIZAR**
  Diploma In Electrical and Electronics Engineering
  JDT Islam Polytechnic College, Vellimadukunnu, Kozhikode.

5. ISTE SECTION HEAD QUARTERS & STAFF TRAINING COLLEGE PROJECT

The State HQ building of the ISTE Kerala Section is being constructed in Viyyur near Government Engineering College, Thrissur. The building will also be used as Staff Training College. Already Rs. 90 lakhs have been invested for the building project. Due to financial constraints, the construction of the building is at a slow pace.

However, with the support from some of the institutional members and ISTE Head Quarters at New Delhi, the first phase of construction was completed and the buildings being used. The working office of the Institution of Engineers (India) Trichur Local Centre also in ISTE building apart from the office of ISTE Kerala Sections now functioning at this new building.

First stage : Plinth area: 390 sq. m

Ground floor : Reception, Office Room, Library, Staff room, Seminar Hall, Toilets.

First floor : Conference Hall, Double room accommodation

6. WEBSITE OF ISTE KERALA SECTION

ISTE Kerala Section maintains a website (www.istekerala.in) and the activities of the Section are highlighted in the site. The website has all the necessary information regarding the Section, Chapters, Institutional Members, and Student Chapters, a photo gallery, and links to various related sites are also provided.

7. NEWSLETTER OF ISTE KERALA SECTION 'NOISTEKS'

The Newsletter of ISTE Kerala Section 'NOISTEKS' was published regularly. The electronic versions of the newsletter were published in the Website. Dr. Nidhi M. B, National Executive member is the editor.

8. TRAINING PROGRAMMES

ISTE organizes induction training programmes, subject upgradation workshops and other programmes on teaching methodology regularly. The government of Kerala has made a budget provision for Grant-in-Aid to ISTE under head of account 2203-00-104-92-ISTE NP for conducting training programmes for the faculty of Engineering Colleges and Polytechnic Colleges. Every year ISTE organizes these programmes at different institutions directly or associated with the faculty chapter of that institute benefitting a large number of faculty. In the reporting year also, ISTE Kerala Section sponsored FDP (faculty development programmes) in several colleges.

AN OVERVIEW OF CHAPTER ACTIVITIES

1.Fedaral institute of science and Technology, Angamaly

a) Institute Innovation Day Celebration & Technical Talk on Ambidextrous Organizations and Structure

The institute's Innovation Day was celebrated for the first time in the history of FISAT on 16.10.2023 in the Main Seminar Hall. The program organised jointly by ISTE FISAT Chapter and Institute Innovation Council started at 9.30 am. Dr Mini P R, the Principal- in-charge welcomed the gathering. Mr Shimith P R, Chairman FISAT, inaugurated the program. In his presidential address, chairman pointed out innovative thoughts in the events related to our daily life. Dr C Sheela, Director - Research and Development felicitated the function. Mr Rakesh Nair, Marketing Head, Svojas Farms delivered the Institution's Innovation Day message. Mr Praveen, Asst Professor MBA, Ms Raji P and Ms Honey Devassy were the program's coordinators. Dr Asha Joseph, Secretary ISTE FISAT Chapter proposed the vote of thanks.

Inauguration of Institute Innovation Day celebration and Students attending the technical talk on Ambidextrous Organizations and Structure

b) National Seminar on 'Energy Materials for a Sustainable Future"

Inauguration of National Seminar

The Federal Institute of Science and Technology organized a National Seminar on 'Energy Materials for a Sustainable Future' in collaboration with ISTE FISAT Chapter and IIC on 11/11/2023 at the MBA Seminar Hall, FISAT. Commencing at 9:30 am, Ms. Honey mol P Chacko, HoD of S&H, delivered the welcome address to delegates and participants.

The seminar was inaugurated by Dr. Mini P R, Principal-in-Charge (FISAT), emphasizing the crucial role of renewable energy adoption and technological innovations for long-term sustainability in her inaugural address. Dr. Asha Joseph, Secretary of the ISTE FISAT Chapter, felicitated the program.

a) ENVIRONMENT DAY OBSERVATION 2024

On 5 June 2024, Environment Cell, MBCET along with ISTE MBCET organized the celebration of Environment Day with an inspiring and impactful sapling planting event. This event embodied this year's theme, "Restore Our Earth," by focusing on reforestation and environmental restoration. Fr. John Varghese, Director, Dr. S. Viswanatha Rao, Principal, Dr. Abraham T. Mathew, Former Principal, Fr. Thomas Mukalumpurathu, Finance Officer, Deans, HoDs, all faculty and staff members participated in the event. Fr. John Varghese, Director conveyed the importance of maintaining the habitat. Dr. Nidhi M. B., Prof MED and Environment Cell Coordinator shared the Environment Day 2024 theme: Land Restoration, Desertification and Drought Resilience. Dr. Soumya, Coordinator, the Waste Management Cell and Ms. Asha, Chairperson ISTE, Mr. Melvin, Advisor ISTE students' chapter and Mr. Baalamurali and Ms. Priya, Environment Cell Members helped coordinate the event.

b)Workshop on 'Frontiers of Mechanical Engineering: Harnessing the power of AI, ML and IOT'

A Six Day Hybrid Workshop on 'Frontiers of Mechanical Engineering: Harnessing the power of AI, ML and IOT' jointly organized by Department of Mechanical Engineering and ISTE MBCET Chapter, in association with ISTE Kerala Section and University Technology MARA (UiTM) Malaysia was conducted between 06 to 11 May 2024. Topics include AI, Mechatronics and automation, data science and modelling, ML, IoT and Python. Participants visited IBS in Technopark on the 3rd day of the Workshop as part of the industrial visit. Dr. Nidhi M. B., Professor and Ms. Ruby Maria Syriac, Assistant Professor, Department of Mechanical Engineering were the coordinators of the FDP.

a) Water Rocket Workshop

The ISTE GEC STUDENTS' CHAPTER conducted a workshop based on the making and working of water rockets for the first year and second year students at Room no 213 in the main block on 9th and 10thOctober, 2019. The event was inaugurated by Dr. B Jayanand. About 90 students participated in the workshop. The session was taken by Jisspaul James of S7,PE and Adarsh of S7,PE during which they explained the general physics associated with the motion and launching of the rocket. They then proceeded to explain its different parts and the necessary shape and size of the components required to result in the best possible outcome. The practical session of its making and launching was conducted successfully on the 10th of October at college's main ground.

3.TKM College of Engineering, Kollam

4. Rajiv Gandhi Institute of Technology, Kottayam

FIRST YEAR ORIENTATION

The ISTE TKMCE organized an orientation program for the new students in two phases. The first phase took place in conjunction with the Student Induction Programme, held at the TKMCE College auditorium. During this session, students received an overview of the vision and mission of the technical society. The second phase occurred on October 4th-6th 2023, in numerous venues. It began with an ice-breaking session, allowing students to interact with all the club heads and ask questions. A comprehensive explanation of the club's purpose, membership benefits, and society activities was provided. This session was instrumental in establishing a rapport with the new students.

MEMBERSHIP DRIVE

ISTE TKMCE membership drive 2023 was officially announced on November 5, 2023. It was open to all students irrespective of their year of study. The registration procedure was conducted via ISTE TKMCE's official website. The membership drive attracted about 500 students this year owing to our past events and workshops specially designed for today's technology and tools.

CONNECT'24, was held at RIT Kottayam. ISTE Executive Committee members from various colleges participated in the event.

PARTICIPATED COLLEGES:

- GEC Kannur
- GEC Kozhikode
- GEC Thrissur
- GEC Barton Hill, Thiruvananthapuram
- GEC Palakkad
- GEC Idukki
- TKM Kollam
- MACE Kothamangalam
- RIT Kottayam

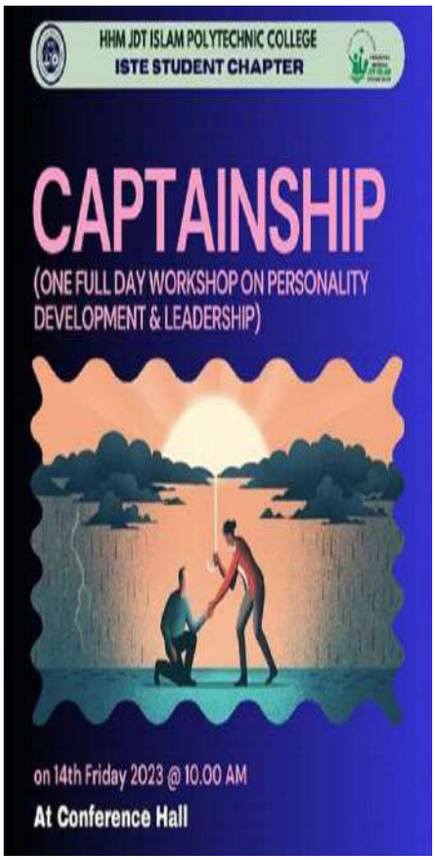
The event started with a chapter presentation of various colleges' achievements and events conducted in previous years. It was followed by a Talk and QA session with Manju K Manohar, TEDx Speaker's Coach and ISTE SC RIT Ex-Chairperson, as the speaker. The participants put various effective ideas in a group discussion. After the lunch break, break and connect and a chapter conference were held. A discussion on the coming ISTE state convention was also held.

MOCK PRESS

The Mock Press Competition held in connection with the inauguration of the ISTE (Indian Society for Technical Education) chapter at Model Polytechnic College, Vadakara, on April 4, 2024, served as a platform to engage students and encourage critical thinking and communication skills. The event aimed to simulate a real-world press scenario where participants were tasked with representing famous personalities. The event witnessed enthusiastic participation from students across various disciplines, showcasing their talents and abilities to portray their respective famous personalities in var-

ious fields including politicians, actors, scientists, and other prominent individuals,each characterized by unique mannerisms and speech patterns.

CAPTAINSHIP WORKSHOP



ISTE Chapter of JDT Islam Polytechnic College conducted one full day workshop on Personality Development and Leadership on 14th July 2024. The chief guest of the workshop was by Mr.Sulfeeker Aly P K, City Head Unacademic, Educator, Life coach, and Motivational speaker. During the session certificates were distributed to the state winners of Poster Designing and Participants of Paper Presentation. Through the workshop, activities and tasks were assigned to the participants through which they could identify their skills and attain better personality and leadership quality. The students witnessed the launch of the great miles stone of India, Chandrayan 3 during the Work Shop. The workshop was inaugurated by Principal Mr. Manuel George and Presided by Ms Ruksana TP- ISTE Secretary. Ajay Anand A-ISTE Faculty advisor, delivered the welcome address and Abraham Jolly-ISTE Student Chairman delivered vote of thanks. More than 100 students participated the workshop.

SUPPORT TO THE CHAPTERS

ISTE Kerala section extends full support, valuable suggestions, and guidance to the Chapters for conducting FDP, Workshops, National and International Seminars, Technical talks, SRM competitions, etc.

Secretary cum Treasurer

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ISTE KERALA SECTION AWARDS – 2024

I. BEST TEACHER AWARD (Engineering College Stream)

Dr. Jayasree P. K.
Professor of Civil Engineering, College of Engineering, Thiruvananthapuram.

II. BEST TEACHER AWARD (Polytechnic College Stream)

Dr. Anish R.
Lecturer in Mechanical Engineering, Govt. Polytechnic College, Cherthala.

III. BEST FACULTY ADVISOR AWARD (Engineering College Stream)

Mr. Ramanand A. C.
Asst. Professor (ECE), Govt. College of Engineering, Kannur.

IV. FACULTY ADVISOR: SPECIAL APPRECIATION AWARD (Engineering College Stream)

Dr. Soumya A. V.
Asst. Professor, EEE Dept., MBCET, Thiruvananthapuram.

V. BEST FACULTY ADVISOR AWARD (Polytechnic College Stream)

Mr. Ajay Anand A.
Lecturer (Automobile), JDT Islam Polytechnic College, Calicut.

VI. BEST FACULTY CHAPTER AWARDS (Engineering College Stream)

1. **Best Faculty Chapter:**
   Federal Institute of Science & Technology (FISAT), Angamaly.
2. **Faculty Chapter with Max. No. of Activities:**
   Vidya Academy of Science & Technology (VAST), Thalakkotukara.
3. **Faculty Chapter with Variety of Activities:**
   Mohandas College of Engineering & Technology, Thiruvananthapuram.
4. **Special Appreciation Award:**
   Mar Baselios College of Engineering & Technology (MBCET).

VII. BEST FACULTY CHAPTER AWARDS (Polytechnic College Stream):

1. **Best Faculty Chapter:**
   JDT Islam Polytechnic College, Calicut.
2. **Faculty Chapter with Maximum No. of Activities:**
   Malabar Polytechnic Campus, Cherpulassery.

ISTE KERALA SECTION AWARDS – 2024

VIII. BEST STUDENTS' CHAPTER AWARDS (Engineering College Stream)

1. **Best Students' Chapter**
   Govt. College of Engineering, Kannur.
2. **Students' Chapter with Max. No. of Activities**
   Trinity College of Engineering, Thiruvananthapuram.
3. **Students' Chapter with Variety of Activities**
   Govt. Engineering College, Barton Hill.
4. **Students' Chapter with Max. No. of New Membership**
   Govt. Engineering College, Thrissur.
5. **Special Appreciation Awards**
   Govt. Engineering College, Wayanad &
   TKM College of Engineering., Kollam.

IX.BEST STUDENTS' CHAPTER AWARDS (Polytechnic College Stream):

1. **Best Students' Chapter**
   Model Polytechnic College, Vadakara.
2. **Students' Chapter with Max. No. of Activities**
   JDT Islam Polytechnic College, Calicut.
3. **Students' Chapter with Variety of Activities**
   Malabar Polytechnic Campus, Cherpulassery.

Chairman, ISTE Kerala Section

ISTE KERALA SECTION AWARDS – 2024

BEST TEACHER AWARD
(Engineering College Stream)
Dr. JAYASREE P. K.
Professor, Civil Engineering
College of Engineering, Thiruvananthapuram.

BEST TEACHER AWARD
(Polytechnic College Stream)
Dr. ANISH R.
Lecturer , Mechanical Engineering
Govt. Polytechnic College, Cherthala.

BEST FACULTY ADVISOR AWARD
(Engineering College Stream)
Mr. RAMANAND A.C.
Asst. Professor (ECE)
Govt. College of Engineering
Kannur

FACULTY ADVISOR:
SPECIAL APPRECIATION AWARD
(Engineering College Stream)
Dr. SOUMYA A. V
Asst. Professor(EEE), MBCET
Thiruvananthapuram

BEST FACULTY ADVISOR AWARD
(Polytechnic College Stream)
Mr. AJAY ANAND A.
Lecturer (Automobile)
JDT Islam Polytechnic College
Calicut.

BEST FACULTY CHAPTER AWARDS
(Engineering College Stream)

BEST FACULTY CHAPTER
FEDERAL INSTITUTE OF SCIENCE & TECHNOLOGY (FISAT), ANGAMALY

FACULTY CHAPTER WITH MAX. NO. OF ACTIVITIES

VIDYA ACADEMY OF SCIENCE & TECHNOLOGY (VAST)

FACULTY CHAPTER WITH VARIETY OF ACTIVITIES

MOHANDAS COLLEGE OF ENGINEERING & TECHNOLOGY THIRUVANANTHAPURAM

SPECIAL APPRECIATION AWARD

MAR BASELIOS COLLEGE OF ENGINEERING & TECHNOLOGY (MBCET) THIRUVANANTHAPURAM

BEST FACULTY CHAPTER AWARDS
(POLYTECHNIC COLLEGE STREAM)

BEST FACULTY CHAPTER

Mr. MANUEL GEORGE
Chairman, ISTE
Principal, JDTIPTC

Ms. RUKSANA T. P.
Secretary, ISTE
Lecture in Civil Engineering, JDTIPTC

ISTE STUDENT CHAPTER

Mr. AJAYA ANAND A
Faculty Advisor, ISTE
Lr. in Automobile Engg., JDTIPTC

Mr. ABRAHAM JOLLY
Chairman, ISTE
3rd Year CE, JDTIPTC

Mr. RAZIN RAHMAN
Secretary, ISTE
2nd Year CE, JDTIPTC

JDT ISLAM POLYTECHNIC COLLEGE, CALICUT.

FACULTY CHAPTER WITH MAXIMUM NO. OF ACTIVITIES
(POLYTECHNIC COLLEGE STREAM)

MALABAR POLYTECHNIC CAMPUS, CHERPULASSERY.

MRV GROUP

Mazhuvara, Atturpuram, Poovar

7339316291

OUR COMPANINES

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National Seminar on 'Transformative Innovations Shaping the AI-Driven Epoch'

The AI Revolution in Automotive: From Showroom to Street

Keynote Lecture

Shyam Unnithan
Technologist, Innovator, Mentor

The automotive industry is experiencing a revolutionary transformation, with artificial intelligence reshaping every touchpoint of the automotive journey. From the way cars are conceived and built to how they're sold and driven, AI is creating unprecedented opportunities for innovation and efficiency across the entire automotive value chain.

In customer acquisition, global leaders are setting new standards. Mercedes-Benz has pioneered AI-powered digital retail platforms that analyze customer behavior to create personalized shopping experiences. Tata Motors' AI-powered "Imaginator" platform allows customers to virtually experience and customize vehicles through an immersive digital interface. BMW's AI-driven marketing system uses predictive analytics to identify potential customers and tailor communications effectively.

Customer experience has evolved dramatically through AI integration. Nissan's connected car services offer predictive maintenance alerts and personalized driving advice through their NissanConnect platform. Ola Elec-

tric's smartphone app provides AI-powered predictive maintenance and personalized charging recommendations for their electric scooter users. Toyota's T-Connect system delivers personalized vehicle recommendations and maintenance alerts, while Hyundai's AI chatbot service handles customer queries round-the-clock.

In autonomous driving, innovation spans across continents. Nissan's ProPILOT 2.0 system represents a significant advancement in hands-off highway driving capability. Waymo's partnership with Jaguar Land Rover showcases fully autonomous I-PACE electric SUVs operating in multiple cities. Mercedes-Benz's Drive Pilot system represents one of the first Level 3 autonomous driving systems approved for commercial use in Germany.

Driver assistance systems demonstrate impressive advancements globally. Mahindra and Mahindra's Advanced Driver Assistance System in their XUV700 uses AI to provide features like adaptive cruise control and autonomous emergency braking. Honda's Sensing Elite system includes sophisticated AI-powered assistance features, while Subaru's EyeSight technology uses AI-powered cameras to monitor traffic movement and prevent collisions.

Supply chain management has been revolutionized by AI implementations. Toyota's famous just-in-time system now incorporates AI to optimize inventory levels and predict parts requirements. Volkswagen's AI-powered supply chain management system predicts potential disruptions well in advance, while Tata Motors has implemented AI-driven logistics optimization across their supply network.

In manufacturing and production, innovation is widespread. Nissan's Intelligent Factory initiative at the Tochigi Plant showcases AI-powered production systems with smart energy management. Tata's Manufacturing Execution System at their Pune plant demonstrates sophisticated quality control and predictive maintenance systems. Ola Electric's Future Factory, the world's largest two-wheeler factory, exemplifies data-driven manufacturing at scale. Mercedes-Benz's Factory 56 represents another pinnacle of AI-powered manufacturing.

Product planning has been transformed by AI's analytical capabilities. Ather Energy uses machine learning to analyze rider behavior and vehicle performance data for continuous improvement of their electric scooters. Porsche optimizes vehicle configurations for different markets through AI analysis, while Tesla uses fleet data to enhance vehicle features and performance continuously.

In sales and marketing, digital innovation leads the way. Audi's virtual showrooms use AI to enable detailed vehicle configuration and visualization. Lexus has implemented AI-powered digital marketing platforms that create personalized content for different customer segments, while Volkswagen's predictive analytics system optimizes advertising across channels.

Looking ahead, the automotive industry's embrace of AI continues to accelerate. Major investments in digitalization and AI technology from both global and Indian manufacturers signal the industry's commitment to an AI-driven future. From established giants to emerging electric vehicle manufacturers, companies are pushing the boundaries of what's possible with AI in automotive applications.

Despite the challenges of data privacy and regulatory compliance, the automotive industry's AI revolution shows no signs of slowing. From Mahindra's advanced driver assistance systems to Toyota's supply chain optimization, from Tata's smart manufacturing initiatives to Nissan's comprehensive AI ecosystem spanning ProPILOT autonomous systems and Intelligent Factory innovation, artificial intelligence is creating vehicles that are smarter, safer, and more attuned to human needs. This isn't just about building better cars – it's about reimagining the entire automotive experience for a new era of mobility.

Thank you

Integration of Artificial Intelligence in Satellite Constellation Design for Global Aircraft Surveillance and Safety

Abhinanth Jayakumar | Asheak Neha Noushad | Sreelekshmi Pramod

Department of Aeronautical Engineering, ACE College of Engineering, Thiruvallam, Trivandrum
Email: abhinanth.j@acetvm.com

Abstract

The need for extensive aircraft monitoring and the complexity of managing air traffic worldwide have made the use of cutting-edge technologies necessary to improve safety, effectiveness, and dependability. When combined with artificial intelligence (AI), satellite constellations provide a reliable way to monitor aircraft operations in real time and globally. With an emphasis on crucial safety features including real-time weather monitoring, emergency alert systems, and mid-air collision detection, this review article investigates the incorporation of AI technology into satellite constellation architecture. Machine learning (ML), deep learning, and reinforcement learning are important AI technologies that support this strategy. Effective collision avoidance is supported by the detection of irregularities in aircraft trajectories, which is made possible by machine learning techniques. Accurate predictive weather modelling is made possible by deep learning models, especially convolutional neural networks (CNNs), which allow real-time processing and interpretation of meteorological data collected by satellites. In order to preserve aviation safety, reinforcement learning algorithms are used to optimize orbital configurations and communication links, guaranteeing fast data transmission and continuous worldwide coverage.

Additionally, emergency notifications are effectively distributed across a variety of communication platforms using AI-powered natural language processing (NLP), guaranteeing the prompt and precise delivery of vital information. AI-optimized satellite constellations can be designed, modelled, and assessed using the Systems Tool Kit (STK), a simulation platform. This simulation framework sheds light on predictive analytics, sophisticated collision avoidance techniques, and adaptable emergency management systems. An important technological development that offers notable enhancements to the sustainability, efficiency, and safety of international aircraft surveillance systems is the incorporation of artificial intelligence (AI) into the planning and management of satellite constellations.

Key Words: Aircraft surveillance, Mid-air collision detection, Machine Learning (ML), Deep Learning, Reinforcement Learning, Satellite constellation..

A comprehensive survey on techniques to ensure Media Integrity

Divya Madhu,
Lecturer in Computer Engineering,
Govt Polytechnic College, Cherthala

Abstract

The rapid advancement of generative AI, machine learning, and deep learning has led to the evolution of deepfake technology, enabling the creation of synthetic media. The proliferation of these deepfake media, particularly in the form of altered videos, images, and audio, poses significant threats and challenges to trust, national security, and privacy across multiple domains. Consequently, the need for technologies capable of automatically detecting and assessing the integrity of digital visual media has become critical. This paper aims to present a comprehensive survey of state-of-the-art deepfake detection techniques. By consolidating the existing literature and highlighting research trends and challenges, it seeks to support the development of novel and effective approaches to combat the growing threat of deepfake media, ensuring the integrity, privacy, and security of digital visual media in an increasingly complex and interconnected world.

Key Words: Deepfake, Image, Audio, Video, Detection

AI in Education: A review

Dr. Nidhi M B
Professor,
Mar Baselios College of
Engineering and Technology, Nalanchira
nidhi.mb@mbcet.ac.in

Dr. Soumya A V
Assistant Professor,
Mar Baselios College of
Engineering and Technology, Nalanchira
soumya.av@mbcet.ac.in

The integration of Artificial Intelligence (AI) technologies in the education system has gained significant attention in recent years especially with its capabilities on enabling adaptive, personalized, and scalable learning experiences. This paper gives a comprehensive review of the various applications, benefits, and challenges associated with AI-enabled education. Research studies already indicate that 86% of global student community are already using generative AI and the market growth in adopting AI is expected to reach $6 billion by 2025. The purpose of the study is to understand how AI in education helps educators identify gaps in student knowledge and provide targeted feedback to improve learning outcomes. In recent years, there has been an emergence of more advanced AI-enabled learning systems, which are gaining traction due to their ability to deliver learning content and adapt to the individual needs of students. Educators are at advantage about learning progress of students through data driven insights, gamified learning strategies for students' engagements, early intervention alerts, engagement, behavior, and emotional well-being etc. Technology-enhanced learning uses learning and teaching systems that are technology based, allowing students to develop knowledge and skills with the help of lecturers, tutors, learning support tools and technological resources. Furthermore, it examines the impact of AI on student performance, teacher effectiveness, and the overall learning environment. The advantages of utilizing such learning systems include constant availability and accessibility to course materials, cost savings, collaboration amongst students and lecturers, improved performance, feedback from users and effective communication. The research paper also addresses concerns related to data privacy, algorithmic biases, and the importance of teacher training for successful AI implementation in education.

Keywords: AI, educators, technology enhanced learning

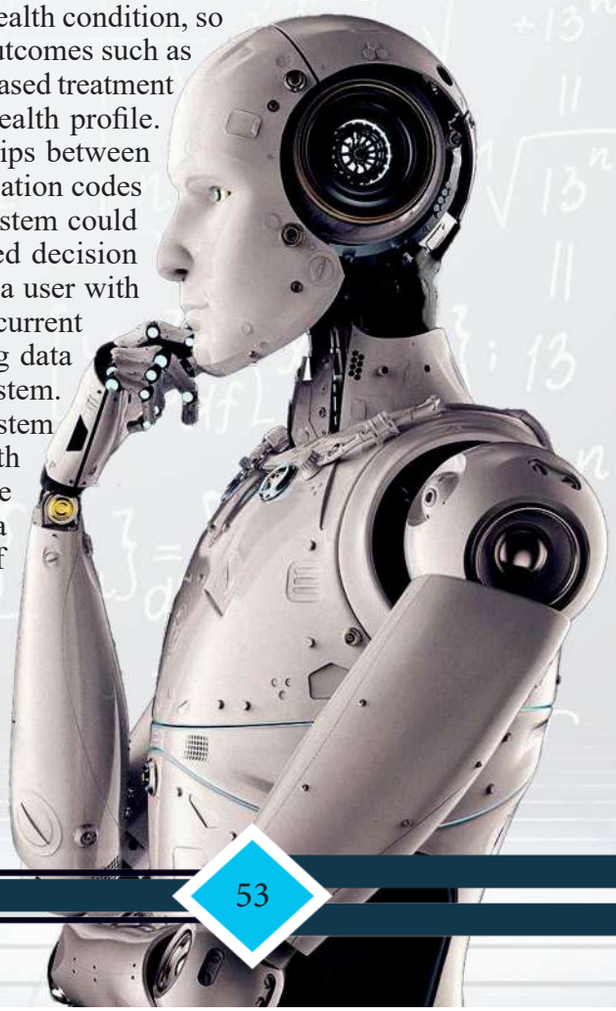
Machine Learning Techniques for Health Care Recommendation Systems

Poorna B.R
Assistant Professor,
Department of Computer Science and Engineering
Mar Baselios College of Engineering and Technology, Nalanchira

Abstract

Recommender systems (RS) are in widespread use nowadays. These systems can be seen in use in online retailers such as Amazon, or social media platforms such as Facebook, or even streaming services such as Netflix. Online e-commerce model such as Amazon recommend goods based on your browsing and purchase history.Music streaming services like Spotify, propose songs and artists based on your listening history.Podcast streaming providers such as Netflix recommend movies and TV series based on your watching history.

These sites continue to improve their recommendation algorithms so that users stay to consume the products they have to offer.A healthcare recommender system analyses a large amount of patient data which helps to derive insights and assist the prediction of diseases. This system should be intelligent in order to predict a health condition by analyzing a patient's lifestyle, physical health records and social activities. Their main objective is to ensure the availability of the valuable information at the right time by ensuring information quality, trustworthiness, authentication and privacy concerns. As people use social networks to understand their health condition, so the health recommender system is very important to derive outcomes such as recommending diagnoses, health insurance, clinical pathway-based treatment methods and alternative medicines based on the patient's health profile. In particular, the system could deal with complex relationships between medical concepts, resolve medical abbreviations and classification codes and adapt to the user's medical level of expertise. Such a system could also reduce the effects of information overload (i.e., delayed decision making, distraction, waste of time and stress), as it provides a user with those items of interest most relevant for a given case or the current medical context. Health care analytics is a major area in big data analytics which can be incorporated into the recommender system. The health-based recommender system is a decision-making system which recommends proper healthcare information to both health professionals and patients. By using this system, patients are recommended the proper treatment of disease for avoiding a health risk, and health professionals benefit from the retrieval of valuable information for clinical guidelines along with delivery of high-quality health remedies for patient . The application of machine learning (ML) and deep learning (DL) in healthcare support systems is growing more rapidly than ever. This paper reviews and discusses some machine learning and deep learning methods for health care recommendation.



"AI-Driven Mobility: Transformative Innovations in Automotive Engineering"

AJAY ANAND A
Department of Automobile engineering
JDT Islam polytechnic college, Kozhikode, India
+918907123716 | ajayanandmsd@gmail.com

Abstract

This abstract explores the transformative innovations shaping the AI-driven epoch, with a particular focus on the integration of Advanced Driver Assistance Systems (ADAS) and Artificial Intelligence (AI) within the automotive industry. As we transition into an era dominated by AI, the convergence of ADAS and AI is at the forefront of revolutionizing vehicle safety, performance, and the driving experience. This paper highlights the pivotal components of ADAS—such as collision avoidance, lane departure warning, and adaptive cruise control—and examines how these technologies work synergistically with AI to enhance real-time decision-making and accident prevention. Machine learning and computer vision, key AI technologies, play an essential role in processing extensive sensor and camera data, enabling vehicles to navigate complex environments autonomously. The collaboration between ADAS and AI not only fosters safer roads but also accelerates the development of fully autonomous vehicles. By delving into these innovations, this abstract provides a snapshot of the dynamic interplay between AI and automotive engineering, offering a foundation for a deeper exploration of how AI is driving transformative changes in industries worldwide.

Keywords: Artificial Intelligence(AI) Advanced Driver Assistance Systems (ADAS), Computer Vision, Automobile engineering, machine learning algorithms, Smart Mobility, radar, cameras, autonomous driving, vehicle safety, Real-Time Decision Making, communication protocols, automotive technology, semi-autonomous, driving experience.

Leveraging Artificial Intelligence for Detecting Well Water Contamination:

A Step Towards Sustainable Environmental Management

Ruksana T P
Lecturer, Department of Civil Engineering
JDT Islam Polytechnic College, Kozhikode, Kerala
ruksanatp@gmail.com

Abstract

The growing dependence on groundwater sources, particularly wells, for drinking and agricultural purposes necessitates advanced methods to ensure water quality. Traditional approaches to contamination detection are often labor-intensive and time-consuming. Artificial Intelligence (AI) offers an innovative solution to overcome these limitations by enabling accurate, efficient, and scalable water quality monitoring systems. This paper explores the application of AI techniques—including machine learning models and sensor integration—to detect common well water contaminants such as heavy metals, nitrates, and microbial pathogens. It highlights the role of predictive analytics, anomaly detection, and real-time monitoring in safeguarding public health and promoting environmental sustainability. Case studies demonstrate the efficacy of AI-driven systems, underscoring their potential to revolutionize water quality management.

Keywords - Artificial Intelligence, Well Water Contamination, Machine Learning, Environmental Sustainability, Water Quality Monitoring, Real-Time Analysis

Transforming Natural Fiber Polymer Composites with AI for Environmental Sustainability

Abstract

Natural fiber polymer composites (NFPCs) have emerged as sustainable alternatives to conventional materials due to their lightweight, biodegradable nature, and cost-effectiveness. However, challenges like inconsistent material properties and suboptimal fiber-matrix interactions limit their widespread adoption. The integration of artificial intelligence (AI) into NFPC development presents a transformative approach to overcome these challenges. AI-driven techniques can optimize fiber selection, treatment methods, composite fabrication, and property prediction, leading to enhanced mechanical, physical, and environmental performance. This study explores the potential of AI in advancing NFPCs for environmental sustainability, emphasizing the role of machine learning models in predicting composite behavior and guiding material design.

Keywords: Natural Fiber Polymer Composites (NFPCs), Artificial Intelligence (AI), Sustainability, Fiber-Matrix Interaction, Machine Learning Models

Anish R
Department of Mechanical Engineering,
Govt. Polytechnic College, Kottayam, Kerala, India.
anishrajan.183@gmail.com

Sivasubramanian Palanisamy
Department of Mechanical Engineering,
P T R College of Engineering and Technology,
Madurai, Tamilnadu, India.
sivaresearch948@gmail.com

K. Manickaraj
Department of Mechanical Engineering,
CMS College of Engineering and Technology,
Coimbatore, Tamil Nadu, India.
raj.manicka@gmail.com, nidhi.mb@mbcet.ac.in

Akhil S. Karun
School of Science,
Cochin University of Science and Technology,
Kochi, Kerala, India.
akhilskarun@gmail.com

An Overview of Using Artificial Intelligence and Blockchain to Improve Aerospace System Security, Quality, and Performance



ABHINANTH JAYAKUMAR | FARSANA KURIYAPPILLY RASHEED | SAFA ABDUL SAMAD

DEPARTMENT OF AERONAUTICAL ENGINEERING,
ACE COLLEGE OF ENGINEERING, THIRUVALLAM, TRIVANDRUM
Email: abhinanth.j@acetvm.com

Abstract

In order to enhance the performance and safety of aeronautical systems, this study explores the potential applications of blockchain technology with artificial intelligence (AI).Leading the world in mechanical development, the aerospace sector is constantly aiming for dependability, efficiency, and security. The possibility of blockchain technology and artificial intelligence (AI) as revolutionary electronics that enhance productivity and flexibility in aerospace designs is examined in this study. The predictive capabilities of AI and the inherent security of blockchain technology allow for novel solutions to the changing production issues. Cryptocurrencies like Bitcoin initially popularized blockchain technology, which has since grown into a powerful tool for transparency and dossier security. In the aerospace sector, it has the potential to improve airplane lifecycle management, boost functional proficiency, and transform supply chain management. This work provides an inclusive overview of the state of the art, possible uses, difficulties, and recommendations for further research in this area, supported with suitable composition.

These sciences present acceptable, managerial, and mechanical challenges that should be investigated even as they also offer the possibility of major breakthroughs. This item serves as an inclusive survey for researchers, masters, and stockholders and showcases the transformative potential of blockchain and artificial intelligence in the aerospace industry. The combination of these technologies promises to boost output and flexibility while also holding the key to new opportunities for innovation in airplane construction.

Key Words: Data integrity, Predictive maintenance, Autonomous systems, Real time analytics..

Enhancing Hazard Detection in Autonomous Robots Using SLAM Algorithms

Dr.Michael George
Department of Electronics,
Rajiv Gandhi Institute of Technology,
Kottayam,Kerala,India

Ms Sini.M
JDT Islam Polytechnic College,
Kozhikode, Email:sinimrit@gmail.com

Abstract

This paper explores the enhancement of hazard detection in autonomous robots by leveraging Simultaneous Localization and Mapping (SLAM) algorithms. Autonomous robots operate in dynamic and unpredictable environments where the ability to detect and avoid hazards is critical for safety and efficiency. Traditional hazard detection methods often rely on predefined static maps, which fail to adapt to real -time changes in the environment. SLAM algorithms, which enable robots to construct and update maps of their surroundings while determining their location, provide a dynamic and robust solution to this challenge. This study evaluates the integration of SLAM with sensor fusion techniques to improve hazard detection accuracy and response time. By combining data from LiDAR, cameras, and inertial measurement units (IMUs), the proposed system identifies obstacles, uneven terrain, and other potential hazards with high precision. Additionally, adaptive path planning is incorporated to enable real-time navigation adjustments, ensuring the robot can respond effectively to newly detected risks. The results demonstrate that the enhanced SLAM-based hazard detection system significantly outperforms conventional methods in both static and dynamic environments. This approach holds promise for applications in search-and-rescue missions, industrial automation, and autonomous vehicle navigation, where safety and reliability are paramount.

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Two roads diverged in a wood,
and I took the one less traveled by,
And that has made all the difference.
- Robert Frost
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MOB: +91 9495 707 555
Email: marianarch.in@gmail.com

MARIAN COLLEGE OF ARTS & SCIENCE
MOB: +91 9526 605 413
Email: principal@mcas.ac.in

MARIAN CRAFT & ARTS CENTRE OF EXCELLENCE
MOB: +91 8301 908 450
Email: marianartscrafts@gmail.com

LITTLE FLOWER FOOTBALL ACADEMY (LiFFA)
MOB: +91 9746 870 421
Email: info@liffatrivandrum.org

ST. JACOB'S TRAINING COLLEGE (B.Ed)
MOB: 0471 270 4251
Email: stjacobsbed@gmail.com

Marian Business School (MBA).
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