IEEE COMPUTER SOCIETY
Bangalore Chapter

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JUNIORS

IEEE CS Junior – STEMpire:

Crafting Tomorrow's Innovators program

Introduction

The IEEE Computer Society Bengaluru Section expanded the CS Juniors – STEMpire initiative into a multi-location outreach program in 2025. This expanded edition spanned leading engineering campuses, including BMSCE, NITK Surathkal, CMR University, CMRIT, BNMIT, BMSIT&M, and Vemana Institute of Technology, reaching over 1,200 school students across urban, semi-urban, and rural regions of Karnataka.

This year's program delivered experiential STEM learning through hands-on sessions in Python programming, cybersecurity, IoT, embedded systems, web development, and AI awareness, ensuring early and equitable exposure to emerging technologies for students from Grades 6–10.

Program Overview

STEMpire marked a major expansion of the IEEE CS Juniors outreach model. Instead of a single-venue event, the initiative collaborated with multiple institutions to conduct distributed workshops adapted to local learning needs.

Across all venues, students engaged in:

- Python programming fundamentals
- Cybersecurity and digital safety awareness
- HTML, CSS, and JavaScript basics
- IoT and hardware project building
- Creative tech exposure
- Engineering campus tours and demonstrations

The program successfully combined technical education with interactive exploration, helping students gain real confidence in computational thinking and hands-on engineering.

Keynote Highlights

Each hosting institution opened the program with powerful keynote messages from faculty leads, IEEE volunteers, and technical mentors.

These addresses emphasized:

1. The societal impact of technology
2. The importance of curiosity-driven learning
3. Ethical and responsible use of digital tools
4. The importance of building foundational STEM literacy early

Speakers encouraged students to explore new technologies fearlessly, sparking excitement for the hands-on learning that followed. This consistency of messaging across institutions helped unify the multi-location program's vision and impact.

Hands-On Learning Across Karnataka

Experiential learning was the core strength of the 2025 STEMpire edition. Each participating institution designed sessions tailored to its facilities and volunteer expertise, enabling rich and diverse workshops across Karnataka.

Python Programming Tracks

Students were introduced to programming logic through variables, loops, conditionals, simple functions, and guided terminal execution. Mini-projects such as number-guessing games and calculators made coding immediately rewarding.

Cybersecurity & Digital Safety

Cybersecurity workshops covered digital footprints, malware, social media risks, safe password practices, and distinguishing legitimate websites from phishing attempts: interactive quizzes and real-world examples enhanced retention and relatability.

IoT & Embedded Systems Projects

Institutions like BMSCE delivered hands-on electronic prototyping sessions where students built basic circuits, experimented with sensors, and created introductory IoT systems such as traffic light controllers and soil-moisture monitors.

Web Development

Foundational web workshops introduced students to HTML structure, CSS styling, and beginner-friendly JavaScript to quickly build simple webpages. These sessions helped students visualize coding as a creative tool.

Campus Explorations

Many institutions conducted guided campus tours. Students visited innovation labs, libraries, project centers, and design studios, gaining first-hand exposure to engineering education and college environments.

Impact on Students

The response across all venues was overwhelmingly positive.
Teachers reported noticeable increases in:

- Curiosity toward STEM
- Confidence in using computers and coding
- Awareness of safe internet practices
- Interest in pursuing technology as a career

Students particularly enjoyed the hands-on coding and hardware sessions, expressing eagerness to continue exploring STEM topics independently. Many shared that the campus tours gave them a clearer sense of what college life and engineering pathways look like.

Volunteers observed that students asked thoughtful questions, engaged deeply with mentors, and showed strong enthusiasm for the experiential aspects of the program.

Conclusion

The 2025 multi-location IEEE CS Juniors – STEMpire program demonstrated the transformative impact of accessible STEM outreach.

With contributions from:

- Hundreds of IEEE volunteers
- Faculty mentors across multiple campuses
- Coordinated institutional support

The initiative successfully empowered young learners with essential technical skills, digital awareness, and motivation to innovate. The distributed model proved to be a scalable, inclusive blueprint for future editions, ensuring that high-quality STEM exposure reaches students regardless of geography or background. The 2025 edition

stands as a testament to the power of collaboration in shaping the next generation of thinkers, builders, and problem-solvers.

Reflections from Organizers and Faculty Leads

Reflections from Organizers and Faculty Leads

What stood out across every location was the sheer curiosity of the students. Whether they were coding for the first time or exploring IoT kits, their enthusiasm never dropped. It reaffirmed why initiatives like CS Juniors matter.

— Dr. Abhishek Appaji, Program Lead, BMSCE

"*The multi-campus model allowed us to reach students who otherwise may not have had structured exposure to AI, cybersecurity, or programming. This year felt like a major step toward making STEM education more equitable.*"

— IEEE CS Stempire Coordinator

"*When students ask deep questions and want to stay after sessions to learn more, you know you've touched something deep. That's the kind of impact we aim for.*"

— Faculty Coordinator, NITK Surathkal

Volunteer Perspectives

The student volunteers across the institutions felt it very valuable to lead younger learners through actual uses of technology.

"*Teaching school children reminded us why we fell in love with engineering in the first place.*"

— IEEE Volunteer, BNMIT

"*Many students had never written a single line of code before today. Watching them build a working program by the end of the session was incredibly rewarding.*"

— Volunteer, CMR University

"*The discussions on cybersecurity were literally an eye-opener even to us, the mentors. They easily drew in everything into relevance in their day-to-day digital life".*

— CS Volunteer, CMRIT

Teacher feedback continually provided evidence of students who demonstrated increased confidence, engagement, and curiosity. Many institutions reported that students showed interest in continuing to program and were interested in more activities related to STEM.

"*Our students left campus talking about coding, AI, and their future careers-they were inspired in a way we don't often see*."

— Teacher, Koshys Global Academia

"*The IoT session helped my students to appreciate technology as something they could build and not just use."*

— Teacher, Shantiniketan School

Alignment with the CS Juniors Mission

The results from this year's program deeply reflected the focus of the CS Juniors mission to spur early interest in computing, foster digital literacy, and build confidence through hands-on exploration.

Across all the institutions, the program encouraged young learners to experiment, explore, and innovate. Made foundational computing accessible to students coming from different educational backgrounds improved linkage among academia, IEEE volunteers, and the community at large demonstrated the scalability of distributed STEM outreach models demonstrated that early exposure to emerging technologies increases motivation and career awareness substantially. Every child we reach this year brings us a step closer to realizing a future of technology more inclusive, ethical, and imaginative.

List of Host Colleges

Name of the Host College / University	City	Date	Topic 1 Covered	Topic 2 Covered	Number of schools	Number of school students	Number of School Teachers	Number of IEEE /CS Volunteers	Photos
BNM Insitute of Technology	**Bengaluru**	**Oct 9, 2025**	Cyber Security	Website and App building	1	70	5	**16**	BNMIT
BMS Insitute of Technology & Management	**Bengaluru**	**Oct 14, 2025**	Programming	Website and App building	2	120	8	**20**	BMSIT
CMR Institute of Technology	**Bengaluru**	**Oct 17, 2025**	Cyber Security	Programming	5	120	10	**10**	CMRIT
CMR University	**Bengaluru**	**Oct 15, 2025**	Cyber Security	Programming	2	103	20	**20**	CMR U
National Insitute of Technology	**Surathkal**	**Oct 25, 2025**	Programming	Cyber Security	1	183	7	**23**	NITK
B.M.S. College of Engineering	**Bengaluru**	**Oct 25, 2025**	Website and App building	IOT using Arduino	3	120	5	**20**	BMSCE
Bapuji Insitute of Engineering and Technology	**Davangere**	**Oct 27, 2025**	Programming	Website and App building	8	200	20	**40**	BIET
AISYWC 2025	**Ahmedabad**	**Nov 1, 2025**	Cyber Security	Website and App building	1	49	4	**3**	AISYWLC
Vemana Insitute of Technology	**Bengaluru**	**Nov 4, 2025**	IOT using Arduino	Programming	2	100	18	**25**	Vemana IT
Christ University	**Bengaluru**	**Nov 18, 2025**	IOT using Arduino	Cyber Security	2	150	10	**10**	Christ University
				Total	**27**	**1215**	**107**	**187**	

Contact:

Dr. Abhishek Appaji, Chair, IEEE Computer Society Bangalore Chapter

abhishekappaji@computer.org

Images


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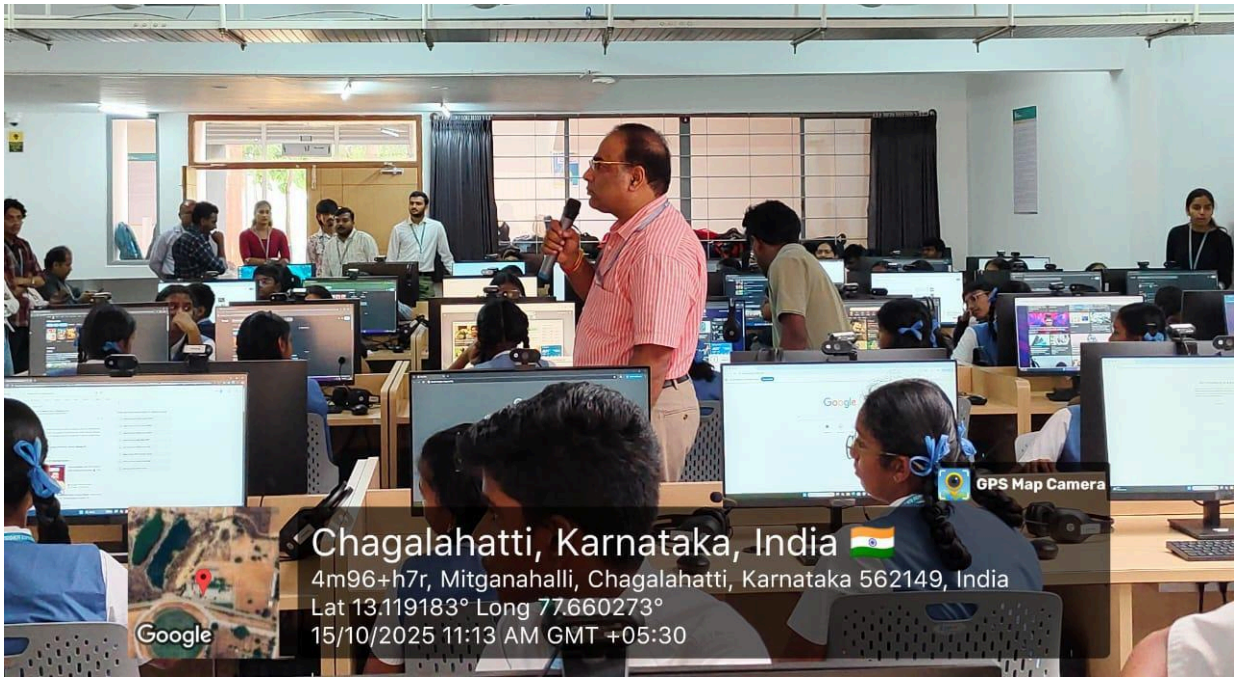
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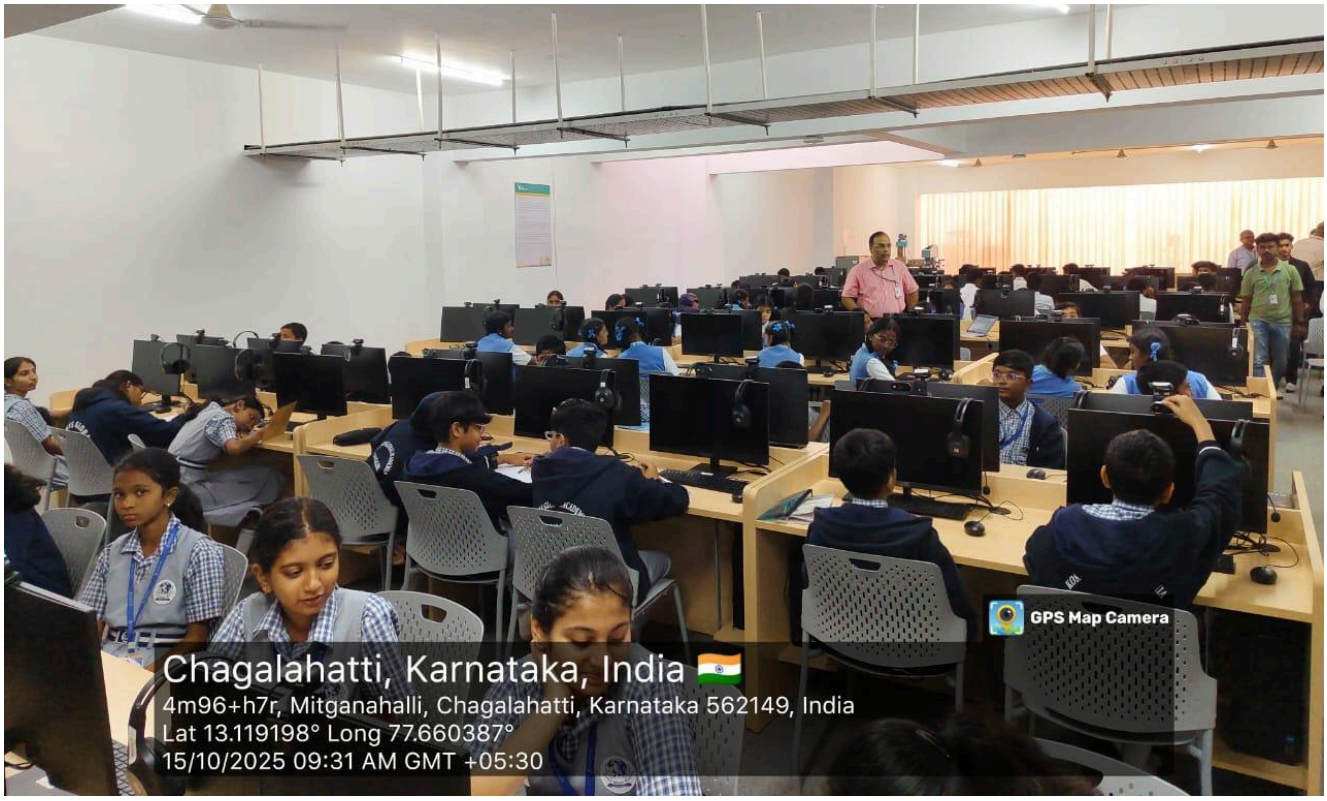
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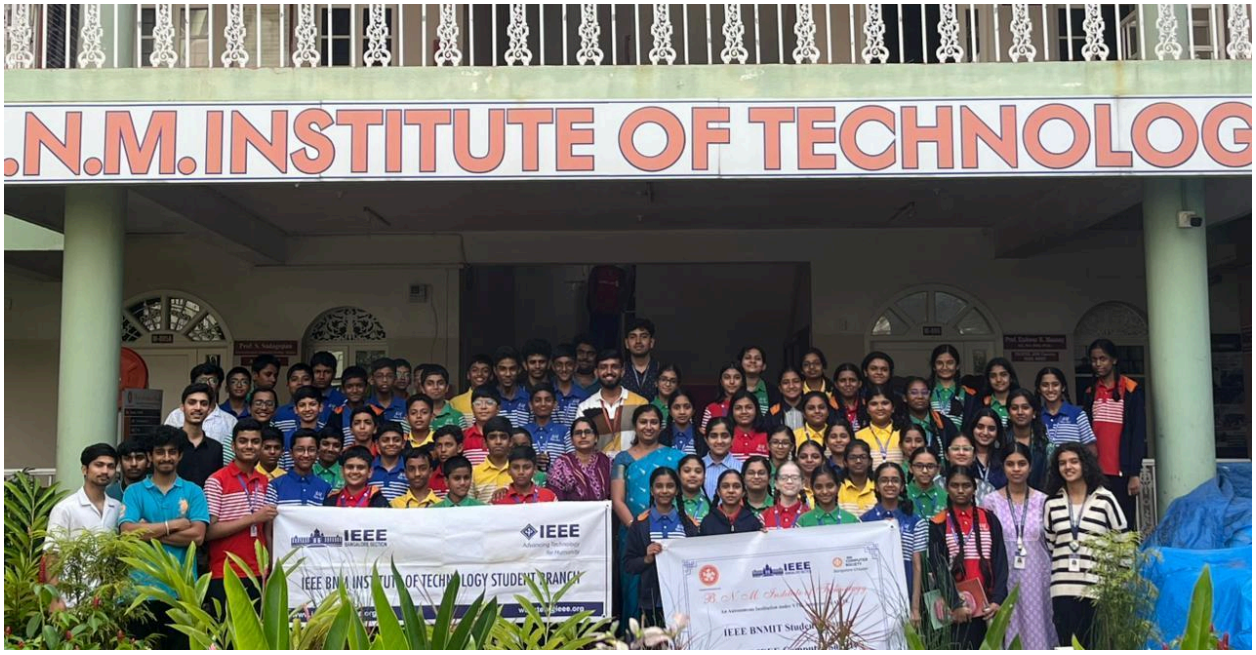
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