



IEEE Aerospace and Electronic Systems Society (AESS) Higher National Engineering School Of Tunis (ENSIT) Student Branch Chapter

Annual Activities Report

Year: 2024

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1 Introduction

The IEEE AESS ENSIT SBC has been very active this year, promoting its aerospace and electronic systems through various events and activities. It has engaged students in technical knowledge, encouraged hands-on experiences, and enhanced career readiness through industry and academic collaborations. This report summarizes the most important activities and achievements that have impacted the community.

2 Mission and Vision

2.1 Mission

To empower students by promoting knowledge and innovation in aerospace and electronic systems through education, hands-on projects, and community engagement.

2.2 Vision

To be a leading student chapter within IEEE AESS, fostering a community where students develop technical skills, network globally, and contribute to advancing aerospace and electronic systems for societal benefit.

3 Excutive Commitee

- Chair: Jinene Ben Said
- Vice-Chair: Cerine Baccouche
- Secretary: Ibtihel Jdey
- Treasurer: Rahma Boufaied
- Event Coordinator: Ranim Baklouti
- Webmaster: Cerine Baccouche

The Board of Directors of IEEE AESS ENSIT SBC is committed to steering the chapter towards growth, engagement, and impact through well-organized activities and initiatives. Each board member plays a vital role in ensuring the chapter achieves its mission and vision.

4 Figures of Merit

- Events Attendees average number: 80-120
- Events and Sessions organized in 2024 number: 42
- Meetings Held : 47
- Distinguished Lectures: 3

- Average DL attendance: 25-30
- Number of Short Courses: 12
- Average attendance at Short Courses: 25-30
- Other events organized: 5
- Joint activities with other Technical Societies: 5
- Industry and academic engagements: 6

5 Major Contributions

The IEEE AESS ENSIT SBC has made several major contributions to the development of its members and the local community. These include the hosting of events like DRONATHON, Stellar Angular, and Astronomica 4.0, which have significantly contributed to the technical and personal growth of participants. The chapter's collaborative efforts with IEEE societies and industry partners have provided members with invaluable networking opportunities.

6 Membership and Growth Statistics

- Total membership of Student Branch Chapter: 28
- New members: 14
- Growth in total membership: 60
- Percentage active members: 70
- People actively involved in Student Branch Chapter governance: 120
- Strategic meetings held: 47
- Meetings attended at Section/Council/Society level: 8

7 Diversity Efforts

Our chapter has been committed to improving membership diversity by actively encouraging participation from underrepresented groups. We have initiated targeted outreach to female students and students from various backgrounds, ensuring a more inclusive environment for all.

8 Overview of 2024 Activities

Throughout the year, IEEE AESS ENSIT SBC organized and participated in various events, workshops, and conferences. These activities were designed to meet the chapter's goals of educational enrichment, professional development, and community building within the fields of aerospace and electronic systems.

8.1 Technical Activities

• Stellar Angular Mini-Hackathon (Jan 20-21):

- Session 1: Introduction to Angular and its applications in Astronomy followed by Practical Angular coding session thenn starting of the Hackathon.
- Session 2 : Guest speaker Ahmed Souissi on technical talks on Angular's relevance in space exploration then announcement of the 3 winners.

This mini-hackathon aimed to introduce Angular to the participants through a handson coding session focused on developing applications for astronomy. Our Trainer Ahmed Souissi shared insights on how Angular can be utilized in space-related projects. **vTools LINK:** https://events.vtools.ieee.org/m/400092



Figure 1: Stellar Angular Mini-Hackathon - Session and Workshop Highlights

• AI and Cybersecurity in Aerospace (Feb 9):

 Session by Oussema Hadj Dahmen on the integration of AI in the aerospace sector.

The session provided an in-depth exploration of how Artificial Intelligence is transforming the aerospace industry, particularly in the context of enhancing cybersecurity measures. The talk was informative, offering new insights into AI's role in aerospace safety and security.

vTools LINK: *https://events.vtools.ieee.org/m/405717*



Figure 2: AI and Cybersecurity in Aerospace - Session Highlights

• Aerodynamic Workshop (May 14-15):

 Covered the basics of aerodynamics and applications in aerospace engineering with our Trainer Mr.Anis Guelbi.

This workshop provided a comprehensive overview of aerodynamics, including essential concepts and practical applications in the design of aerospace systems. Attendees gained valuable knowledge on the principles of flight and aerodynamic testing.

vTools LINK: https://events.vtools.ieee.org/tego/event/manage/393581



Figure 3: Aerodynamic Workshop - Practical Applications

Artemis Event (Oct 16-19):

• Session 1: Overview of the Artemis mission and its significance by Mr. Harlan Phillips, NASA Software Intern.

vTools LINK: *https://events.vtools.ieee.org/m/442929*

• Session 2: Insights on transforming space exploration and integrating science with human missions to the Moon and beyond, by Dr. Lori S. Glaze, NASA's Director of Planetary Science.

vTools LINK: *https://events.vtools.ieee.org/m/442930*

• Session 3: Ambitious goals and mission architecture of the Artemis program, by Dr. Clive Neal, former Chair of NASA's Lunar Exploration Analysis Group.

vTools LINK: https://events.vtools.ieee.org/m/442931

• Session 4: Evolution of NASA's IT strategies from the Apollo era to the Artemis mission, by Dr. Yasser Haridi, NASA's Chief Enterprise Architect.

vTools LINK: https://events.vtools.ieee.org/m/442932

The Artemis event brought together experts from NASA and the space exploration community, offering a captivating journey from the Apollo era to the future of lunar and Mars exploration. Each session provided deep insights into NASA's Artemis program, its groundbreaking technologies, and its transformative impact on space exploration. Mr. Harlan Phillips opened the event by sharing how AI and Wi-Fi technology will revolutionize space exploration, particularly on the Moon. Dr. Lori S. Glaze highlighted the integration of scientific research with human missions, setting the stage for future Mars expeditions. Dr. Clive Neal discussed Artemis' lunar exploration goals, while Dr. Yasser Haridi wrapped up the sessions with a discussion on NASA's technological advancements, which continue to shape the future of space exploration. The event was an inspiring experience for attendees from both Tunisia and Mexico, and we are grateful to IEEE AESS Chapter - ENSIT Student Branch and IEEE AESS UPIITA for making this unforgettable event possible.

vTools LINK: https://events.vtools.ieee.org/m/432734



Figure 4: Artemis Event - Space Exploration Sessions

Collaborators and Partners:

• NASA

• IEEE AESS UPIITA

vTools LINK: https://events.vtools.ieee.org/m/408182

- Astronomica 4.0: Aerospace Climate Change A Sustainable Future! (Nov 23): Astronomica 4.0, hosted by the IEEE AESS ENSIT SBC, was a unique event that explored the intersection of aerospace technology and climate change solutions. The event highlighted how advancements in satellite technology, green aviation, and other aerospace innovations are shaping a sustainable future for Earth. Participants had the opportunity to engage with thought leaders, join workshops, and contribute ideas through the Ideathon. It was a day full of learning, innovation, and networking. Below is a breakdown of the key sessions and activities that took place during this inspiring event.
 - 8:00 AM 9:00 AM: Check-In Registration The event began with an energetic check-in session where attendees received their event materials and had the chance to network with fellow participants, getting excited about the day ahead.
 - 9:00 AM 9:15 AM: Opening Remarks Event Overview The opening session provided an overview of the goals of Astronomica 4.0 and an introduction to the exciting activities planned for the day. This set the tone for an enriching and action-packed day.
 - 9:15 AM 9:45 AM: Panel Discussion: IEEE Benefits This panel featured distinguished speakers discussing the benefits of being involved with IEEE. Ms. Abir Tbaakri covered the advantages of being part of AESS, Mr. Yassine Aniba shared opportunities within IEEE, and Mr. Ahmed Aouidi highlighted the benefits of participating in SIGHT (Special Interest Groups on Humanitarian Technology).
 - 10:00 AM 10:45 AM: Keynote Speaker: Dr. Ines Oueslati Dr. Ines Oueslati delivered an insightful keynote on water management, focusing on sustainable water systems and their critical role in ensuring a better future for Earth. Her talk emphasized innovative solutions for water conservation and management in the context of global environmental challenges.
 - 10:45 AM 11:00 AM: Coffee Break A short break where participants could enjoy refreshments, network with other attendees, and discuss ideas from the morning sessions.
 - 11:00 AM 1:00 PM: Parallel Activities
 - * Ideathon Kick-Off (11:00 AM 12:00 PM): The Ideathon launched with the theme "Sustainability Solutions for Earth Space." Teams formed to brainstorm innovative ideas that address pressing environmental challenges, with a focus on sustainable practices for both Earth and space exploration.
 - * Workshop 1: Astrophotography (11:00 AM 12:00 PM): In this workshop, M. Hafedh Driss introduced the art of astrophotography, guiding participants through the process of capturing and processing stunning images of stars, galaxies, and other celestial objects. This hands-on session inspired many to explore the beauty of space through photography.

- 1:00 PM 1:30 PM: Lunch Break Networking During the lunch break, attendees had the opportunity to visit startup booths and network with industry professionals. This was a great time to connect, explore collaboration opportunities, and discover cutting-edge solutions in the field of aerospace and sustainability.
- 1:30 PM 2:30 PM: Distinguished Lecturer Session: Sustainability in Aerospace Dr. Marina Ruggieri, an IEEE AESS Distinguished Lecturer, shared insights into the sustainable innovations transforming the aerospace sector. She discussed how advancements in green aviation and satellite technology are driving a more sustainable future for the aerospace industry and beyond.
- 2:30 PM 3:00 PM: Workshop: The Sun, Our Star Mr. Hichem Ben Yahia took participants on a fascinating journey into the science of our closest star, the Sun. This workshop explored solar phenomena, its significance to life on Earth, and its role in space exploration.
- 3:00 PM 4:00 PM: Ideathon Pitch Presentations Teams presented their innovative ideas from the Ideathon to a panel of judges. Each team showcased their sustainability solutions, which were evaluated for their creativity, impact, and feasibility. This session highlighted the potential for youth-driven innovation in tackling global environmental challenges.
- 3:30 PM 4:00 PM: Break Booth Exploration A short break for attendees to explore booths from startups and organizations, where they could learn about new technologies and solutions related to sustainability and aerospace. This was also an opportunity for further networking.
- 4:00 PM 4:30 PM: Closing Remarks Award Ceremony The event concluded with closing remarks and the award ceremony, where the best Ideathon teams were recognized for their contributions. It was a fitting end to a day full of learning, collaboration, and inspiration.

Astronomica 4.0 was a tremendous success, combining aerospace, sustainability, and innovation to inspire future solutions for climate change. Thank you to all participants, speakers, and organizers for making this event unforgettable. We look forward to continuing to drive sustainable solutions in aerospace and beyond!

Sponsors:

- Cool Tacos
- Cemia AeroDesign
- Orange Digital Center

Collaborators and Partners:

- IEEE AESS Tunisia Section Chapter
- IEEE Tunisia Section
- IEEE ENSIT Sight Group
- Centre Culturel et Sportif De La Jeunesse De Ben Arous
- Société Astronomique de Tunisie (SAT)

– ESPITA School

Number of Attendees: Over 90 attendees participated in the event, including students, professionals, and industry leaders.

vTools LINK: https://events.vtools.ieee.org/m/441633



Figure 5: Astronomica 4.0 - Sustainibility and Aerospace

8.2 Non-Technical Activities

• Ramadanesque Astronomical Evening (Mar 23): This event offered an opportunity for attendees to engage in astronomical discussions and observations, including stargazing with telescopes and learning about equinoxes. The evening was a blend of cultural celebration and scientific exploration.

vTools LINK: *https://events.vtools.ieee.org/m/444482*



Figure 6: Ramadanesque Astronomical Evening - Stargazing and Discussions

- Partial Lunar Eclipse Astronomical Evening (Sep 18): The partial lunar eclipse event provided an incredible opportunity to observe the celestial phenomenon through a telescope, offering participants a firsthand view of the captivating interplay between the Sun, Earth, and Moon. The evening also featured engaging workshops and interactive sessions that delved into the science behind eclipses, explaining their occurrence and significance. This enriching experience combined education and awe, leaving attendees with a deeper appreciation for astronomy.

vTools LINK: https://events.vtools.ieee.org/m/442944



Figure 7: Partial Lunar Eclipse Astronomical Evening - Stargazing and Discussions

8.3 Distinguished Lectures

* **Session 1** : A series of lectures by experts in aerospace and electronic systems.

 $Objective\colon$ To provide students with professional insights and career advice.

 ${\it Impact:}$ Enriched members' understanding of industry trends and career pathways.



vTools LINK: https://events.vtools.ieee.org/m/444521

Figure 8: Distinguished Lecture : IEEE AESS Insights with Dr.Sabrina Greco

- Session 2 : Space Sustainibility with Dr.Marina Ruggieri

Objective: To share insights on the importance of space sustainibility in the aerospace field.

 $\mathit{Impact}:$ Enriched members' understanding of sustainability in the Aerospace industry .

vTools LINK: *https://events.vtools.ieee.org/m/447169*

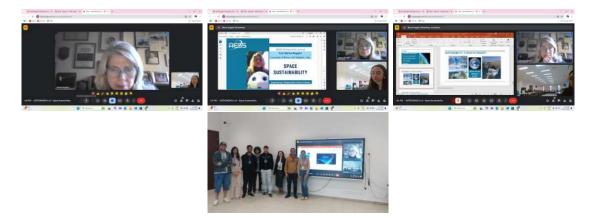


Figure 9: Astronomica 4.0 - Distiguished Lecture: Sustainibility and Aerospace

Session 3 : Sustainable Avionic Systems
 Objective: To share insights on the importance of efficient and Sustainable Avionic Systems.

Impact: Enriched members' understanding of avionic Systems efficieny and architecture.

vTools LINK: *https://events.vtools.ieee.org/m/446068*

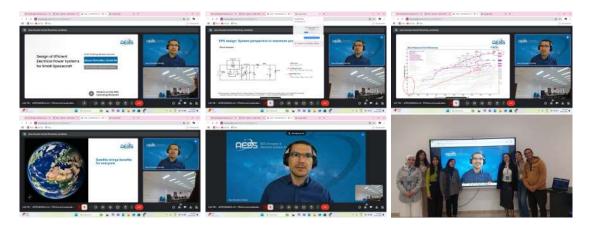


Figure 10: Astronomica 4.0 - Distinguished Lecture : Efficient Avionic Systems

8.4 Social and Collaborative Events

- AESS Ramadan Talks (March 21-24): Four sessions organized in collaboration with five other AESS SB Chapters, providing a rich array of topics from space exploration to technology and innovation. This initiative was aimed at fostering knowledge exchange and collaboration within the IEEE community. **vTools LINK:** https://events.vtools.ieee.org/m/441633



Figure 11: AESS Ramadan Talks - Knowledge Exchange and Collaboration

- Dronathon (April 20-21): Dronathon is a collaborative event organized by IEEE ENSIT (Higher National Engineering School of Tunis) SB and IEEE AESS ENSIT Chapter, dedicated to exploring the exciting world of drones through immersive learning, hands-on innovation, and real-world problemsolving. The event is designed to foster creativity, entrepreneurship, and technical expertise in the drone industry. Participants will engage in various activities, including workshops, conferences, and a hackathon, all aimed at enhancing skills and knowledge in drone technology and related fields.
 - * April 20th:
 - · 9:00 AM 10:00 AM: Check-In Welcome Ceremony Participants begin their Dronathon journey with registration and a welcoming ceremony, setting the stage for two days of innovation and collaboration.
 - 11:00 AM 7:00 PM: Conferences Workshops A series of expert-led conferences and workshops will unfold, covering various aspects of drone technology and the drone industry. Some of the key sessions include:
 - Entrepreneurship Workshop: Learn how to transform a drone idea into a thriving business venture. This workshop will cover business development strategies, financial planning, and startup growth within the drone industry.
 - Aerodynamics Workshop: Understand the principles of aerodynamics that influence drone design and performance, from lift and drag to propulsion and stability.
 - Artificial Intelligence (AI) in Drones Workshop: Explore how AI is revolutionizing drone capabilities, including autonomous flight, object detection, and data analysis.
 - Cleaning the Ocean with Computer Vision Workshop: This workshop focuses on the use of drones equipped with computer vision for environmental monitoring, specifically for ocean cleanup initiatives.

- 7:00 PM: Team-Building Activities Engage in interactive teambuilding exercises, designed to promote collaboration, creativity, and camaraderie between participants. These activities will help the participants bond and prepare for the challenges ahead.
- 12:00 AM: Hackathon Specifications Released The specifications for the hackathon are shared with the participants, marking the beginning of the hackathon phase. Teams will now have until 1:00 PM on April 21st to work together and come up with innovative solutions to the challenges presented in the specifications books.
- * April 21st:
 - 1:00 PM: Hackathon Pitch Presentations Teams present their innovative solutions and demonstrate the results of their hard work during the hackathon. This is the final stage where participants pitch their ideas to a panel of judges, showcasing their technical prowess and creativity.
 - 3:00 PM: Awards Ceremony Winners are announced and awarded prizes based on their achievements and innovative contributions in the field of drones. This closing ceremony celebrates the efforts of all participants and recognizes the best ideas from the event.

DDronathon has a very unique format wherein technological, entrepreneurial, and innovative avenues come together. Be it drones, business development, or environmental concern for sustainability, this two-day event forms an excellent platform to learn, collaborate, and showcase your skills within the dynamic field of flying robots. An inspiring journey of technical expertise, at-the-field challenges combined with entrepreneurial thinking!

Sponsors:

- * IEEE AESS
- * La Poste Tunisienne
- * Orange Digital Center
- * Cool Tacos
- * Cemia AeroDesign

Collaborators and Partners:

- * IEEE AESS Tunisia Section Chapter
- * IEEE RAS Tunisia Section Chapter
- * IEEE Tunisia Section
- * IEEE ENSIT Student Branch
- * ENSIT: Higher National Engineering School Of Tunis
- * UVT: Virtual University of Tunis)
- * ESPITA School
- * SONAPROV
- * Master IASRIA
- * **vTools LINK:** https://events.vtools.ieee.org/m/408182



Figure 12: Dronathon - Drone Building and Racing

8.5 Pre-University STEM Engagement

- Junior Astronauts - Session 1 (Sept): This program introduced young students to the exciting world of space exploration, featuring fun and interactive sessions designed to spark curiosity about science, technology, and the universe.

vTools LINK: *https://events.vtools.ieee.org/m/444474*



Figure 13: Junior Astronauts - Introducing Young Minds to Space

- Junior Astronauts - Session 2 (Sept): This program introduced young students to the exciting world of space exploration, featuring fun and interactive sessions designed to spark curiosity about science, technology, and the universe.

vTools LINK: *https://events.vtools.ieee.org/m/442823*



Figure 14: Junior Astronauts - Introducing Young Minds to Space

- SAT Booth at ASTRONOMICA 4.0: The SAT Booth During Astronomica 4.0 aimed to educate children about Astronomy and Astrophysics. It also featured an observation of the Sun using a Telescope.

vTools LINK: https://events.vtools.ieee.org/m/446078



Figure 15: SAT Booth - Sun Observation

9 Administrative and Strategic Initiatives

9.1 Weekly Meetings

– Held every Thursday to plan, allocate tasks, and review progress.

9.2 Booths and General Assemblies

- Jan 29: AESS booth at ENSIT for recruitment and awareness.

vTools LINK: https://events.vtools.ieee.org/m/402905

- Jan 31: Info session on IEEE AESS and annual planning.
 vTools LINK: https://events.vtools.ieee.org/m/444474
- Sept 4: Booth to introduce IEEE AESS to new students.
 vTools LINK: https://events.vtools.ieee.org/m/444521
- Sept 12: General Assembly for elections and planning.
 vTools LINK: https://events.vtools.ieee.org/m/444519

10 Partnerships and Collaborations

10.1 International Participation

- R8 SYP Grenoble (July 15-19): Poster session and AESS workshop.
 vTools LINK: https://events.vtools.ieee.org/m/444777



Figure 16: R8 SYP - Our Chair Participation

- IES SYP India (July 25-27): Networking and poster presentation.
 vTools LINK: https://events.vtools.ieee.org/m/444777



Figure 17: IES SYP - Our Chair Participation

10.2 Chapter Collaborations

- **IEEE CS Chapter**: Stellar Angular and Cybersecurity workshops.
- IEEE IAS Chapter: 3D Printing Workshop.
- IEEE RAS Chapter: IoT and Arduino workshops.
- WIE and SIGHT: Junior Astronauts program.

11 Monthly Meetings Overview

The monthly meetings are held for discussing future plans, reviewing the past events that took place, and arranging upcoming activities by considering the availability and time constraints of our members. In so doing, the meetings have helped us to expand our vision and develop bigger plans, especially in terms of future collaborations. This approach is vital in refining our strategy and ensuring the success of our initiatives.

12 Achievements and Recognitions

During this year, IEEE AESS ENSIT Chapter realized several major achievements. Among these are:

Participation in the IEEE AESS Newsletter: By providing valuable content for the IEEE AESS newsletter on current projects and member achievements, our chapter further established itself within the IEEE AESS community.

Participation in IEEE R8 SYP: The IEEE AESS ENSIT members had an active participation in the IEEE R8 SYP event, which proved to be an excellent platform for networking and sharing knowledge with similar-thinking professionals across the region.

AESS Workshop at IEEE R8 SYP: Our chapter organized and led a workshop in the IEEE R8 SYP event, which was focused on aerospace and electronic systems, where we engaged participants in hands-on activities and discussions on emerging technologies in the field.

AESS ENSIT Poster Session during IEEE R8 SYP: The chapter also presented our work in a dedicated poster session, showcasing some of the main projects and initiatives that were well received both by peers and industry professionals.

These reflect an active engagement of the chapter within the wider IEEE community and a commitment to developing leadership and innovation in aerospace and electronic systems.

13 Future Vision

IEEE AESS ENSIT Initiatives for the Upcoming Year

For the upcoming year, IEEE AESS ENSIT plans to focus on growth, collaboration, and technical development through the following initiatives:

Collaborations

- International Partnerships: Expanding collaborations with IEEE AESS chapters globally for joint events, conferences, and workshops.
- **Industry Engagement:** Strengthening partnerships with aerospace and electronics industry leaders for internships, industry talks, and collaborative research.
- Société Astronomique de Tunisie (SAT): Continuing joint events with SAT to promote cross-disciplinary learning and growth.

Outreach Programs

 Junior Astronauts: Expanding outreach to schools to inspire youth to pursue STEM careers in aerospace and electronics.

- Women in Aerospace: Promoting gender diversity through dedicated campaigns, workshops, and mentorship for women in the field.
- Community Engagement: Providing scholarships and financial support to ensure equal opportunities for underrepresented groups.

Technical Workshops

- Hands-On Learning: Hosting advanced workshops and hackathons focused on drone technology, satellite systems, and autonomous vehicles.
- **Specialized Training:** Offering workshops on emerging aerospace technologies, such as radar systems and IoT.
- Leadership Development: Organizing leadership and professional development workshops for members.

Event Planning

- Conferences and Symposiums: Hosting international conferences and symposiums for research presentations, industry talks, and networking opportunities.
- **AESS Annual Conference:** Organizing a major event to discuss trends and innovations in aerospace and electronic systems.

These initiatives will strengthen IEEE AESS ENSIT's impact, expand opportunities for members, and further solidify its position in the global aerospace and electronics community.

14 Conclusion

The IEEE AESS ENSIT Student Branch Chapter is a dynamic forum in the fields of aerospace and electronic systems that allows students to deep-dive into these areas. It develops a powerful community comprising enthusiastic and skilled members through the organization of different activities, technical events, and leadership programs. We provide our members with practical training opportunities, technical challenges, and workshops in an atmosphere of working on solving real problems, innovating in high-end segments like radar systems, IoT, and aerospace technologies. Our leadership experience focuses on mentorship, teamwork, and inclusion; it provides students with the tools necessary for professional success while cultivating important communal and purpose-driven learning. It is this overall commitment that readies our membership for outstanding contributions to aerospace and electronics and positions our chapter for innovation and excellence.