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## CHAPTER REPORT

## IEEE Colombia Chapter Events

**IEEE ColCom and National Meeting of Student Branches 2025**  
by Diana Briceño, ViceChair, and Sergio Gutiérrez, Chair, IEEE ComSoc Colombia Chapter

In 2025, the IEEE ComSoc Colombia ComSoc Chapter participated in the organization of two highly relevant events in the country, dedicated to gathering both professional and Student Members: the IEEE Colombian Conference on Communications and Computing 2025 (IEEE ColCom 2025), and the National Meeting of Student Branches 2025 (RNR 2025, by its abbreviation in Spanish).

## EVENT FACTS AND STATISTICS

The IEEE Colombia Section hosts two annual events that bring together the two main target audiences of IEEE: Professional Members and Student Members. On the one hand, the IEEE ColCom conference can be considered the flagship event of the ComSoc Colombia Chapter, gathering academic members from Colombia and other countries in Latin America, North America, and Europe. On the other hand, the National Meeting of Student Branches (Reunión Nacional de Ramas - RNR in Spanish) brings together representatives from the student branches and chapters of all universities in Colombia.

IEEE COLCOM, the main sponsor of which was the IEEE ComSoc Colombia Chapter, was held in Popayán and received a total of 76 submissions. With an international TPC Committee led by Professor Nelson Fonseca and Professor Carlos Astudillo (Unicamp, Brazil), 34 papers were selected from presentations in the main track and the graduate student symposium track. 60 people participated in the technical sessions and keynote speeches presented by world-class researchers who attended the conference.

IEEE RNR gathered 120 student members from 17 different Universities in Colombia. This was an immersive event, developed in Bucaramanga, Colombia, and led by Professor Diana Briceño from Universidad Santo Tomás, who is the ViceChair of IEEE ComSoc Colombia Chapter and leader of the IEEE Colombia Section Student Activities Committee.

## KEYNOTES AND TUTORIALS

COLCOM 2025 featured an outstanding set of keynote speakers who shared their knowledge and the results of their current research with attendees. The opening keynote was presented by Professor Carlos Astudillo from UNICAMP, Brazil, addressing the topic of space communications.

The second keynote was presented by Professor Lisandro Granville from the Federal University of Rio Grande do Sul, and the current CEO of the Brazilian National Network of Teaching and Research - RNR, as abbreviated in Portuguese. Professor Granville presented the perspectives on digital sovereignty and internet centralization. On the second day, world-class researcher Professor Raouf Boutaba from the University of Waterloo presented his keynote on Network Slicing.

Also on the second day, Professor Sandra Rueda from the Universidad de los Andes in Colombia presented her talk on privacy-preserving. Finally, on the third day, Professor Luiz Bittencourt, also from Unicamp in Brazil, presented his talk on edge computing.

On the other hand, RNR 2025, being an event for students, is primarily focused on career and professional development rather than technical aspects. Student members received keynotes and



Group picture of attendees to the IEEE COLCOM 2025 in Popayán, Colombia.



Professor Oscar Caicedo, General Chair of IEEE COLCOM 2025, and Professor Sandra Rueda, Keynote Speaker, Universidad de los Andes, Colombia.



Student representatives of different IEEE student branches are attending the national meeting in Bucaramanga, Colombia, sponsored by the IEEE ComSoc Colombia Chapter.



Students attending one of the technical sessions during the IEEE Student Branches' national meeting. Event sponsored by IEEE ComSoc Colombia Chapter.

conferences on coaching, time management, leadership, and various aspects relevant to incorporation and career development within IEEE. Nevertheless, the event also included technical activi-

ties, consisting of a Cybersecurity challenge developed by Aligo Defensores Informáticos, a Colombian company specializing in penetration testing, information security, and ethical hacking. ComSoc sponsored this particular activity.

#### SOCIAL ACTIVITIES

Networking and Social activities are always an essential activity during these events. Networking activities represent the spaces where relationships among people are created, and collaborative work is engaged. IEEE ColCom 2025 hosted a reception cocktail on the first day at the conference venue. During this cocktail, a group of autochthonous dancers presenting rhythms from the Cauca Region (where Popayán is located) had an exhibition, which ultimately generated the interaction among the attendees of the conference.

The gala dinner of IEEE COLCOM 2025 was held at Don Hidalgo restaurant, one of the most well-known restaurants in Popayán. The gala dinner featured a Salsa Show that was particularly attractive, especially for attendees from abroad.

In its turn, the RNR had the society's fair and the region's fair. The society's chair engaged the interaction of student members with representatives of the different professional societies present at the event. The Regional Fair proposed that students present shows of the culture and gastronomy of the corresponding regions in Colombia, from which they originated. This was an interesting exercise that contributed to building links between colleagues from different cities and regions.

#### CONCLUSION

IEEE ComSoc Colombia Chapter is deeply engaged with fostering technical activities that benefit both professional members and

#### COMSOC NEWS

## IEEE ComSoc Ecuador Celebrates Uyumbicho's 142nd Anniversary with a Community Security Milestone

by Román Lara-Cueva, Universidad de las Fuerzas Armadas, IEEE ComSoc Ecuador Chapter Chair

The 142nd anniversary of Uyumbicho, located north of Mejía canton, 23 km from downtown Quito, was celebrated on July 26th, 2025. IEEE members from the ComSoc Ecuador Chapter played a key role in delivering a project that demonstrates the transformative power of technology for community safety. The initiative, "Technical Support for the Deployment of Devices of the Integrated Security System ECU-911 in the Parish of Uyumbicho," was officially transferred to local authorities and community representatives, marking a moment of celebration and lasting impact.

The project was developed through a collaborative effort among IEEE ComSoc Ecuador, the Universidad de las Fuerzas Armadas – ESPE, and the IEEE Humanitarian Technologies Board (HTB), involving the installation of a 3.8 km fiber-optic network and four strategically placed surveillance cameras. These technologies provide faster emergency response and a heightened sense of safety for over 5,000 residents. IEEE members played a central role in the project's success. The IEEE ComSoc Ecuador Chapter guided the planning and technical execution, ensuring the system addressed the community's needs. HTB advisors provided strategic direction and emphasized the humanitarian purpose of the initiative. IEEE-affiliated faculty and student volunteers from ESPE contributed hands-on technical expertise and worked closely with the community to implement and operate the system.

The anniversary celebration featured the signing of the formal transfer document, symbolizing the community's empowerment by technology. Residents, local leaders, and students witnessed the official moment when the system became fully operational, illustrating how innovation and collaboration can directly improve daily life. Since its implementation, the project has produced measurable benefits. The community's perception of safety increased



Professors from Universidad del Cauca who participated in the Organizing Committee of IEEE COLCOM 2025, the flagship conference of the Communications Community in Colombia.

especially student members, who are the future of the institute. That is why the chapter strongly supported two events developed by the IEEE Colombia Section. On the one hand, the flagship of the Colombian community in telecommunications, COLCOM, which the chapter aims to promote as a relevant venue in the regional community, attracting high-quality works and speakers.

On the other hand, the National Meeting of Student Branches is a valuable venue where student members receive training in various aspects that can contribute to their career development and have the opportunity to interact with professional members to seek advice and inspiration.

from 41% in 2022 to over 81% in 2025, reflecting both the technical effectiveness and social impact. Students have gained valuable experience through hands-on training, while the community actively engaged with the new technology, strengthening trust and resilience.

The project also lays the groundwork for future development. The fiber-optic network enables the potential expansion of smart services, such as IoT applications, smart agriculture, and e-government solutions, positioning Uyumbicho as a model for rural technological resilience. This project in Uyumbicho was made possible through the joint efforts of IEEE members and academic partners, each contributing with complementary roles. The IEEE ComSoc Ecuador Chapter, led by its Chair Román Lara-Cueva, along with six members, took responsibility for overall coordination, technical supervision, and community engagement. The IEEE Humanitarian Technologies Board (HTB) provided strategic guidance, funding support, and international liaison through two advisors. Meanwhile, the Universidad de las Fuerzas Armadas – ESPE, with IEEE-affiliated faculty and students, carried out the technical implementation and mentorship, with 15 volunteers actively contributing to the successful deployment of the solutions in the community.

This project demonstrates how IEEE members can bridge the gap between technology and community needs. By combining professional expertise, academic knowledge, and local collaboration, the team enhanced public safety, fostered community trust, and showcased a powerful example of how humanitarian-focused technological solutions can be successfully implemented in rural areas. As IEEE's guiding principle reminds us, "Advancing Technology for Humanity," this project reflects the lasting impact that committed volunteers, academic institutions, and professional societies can achieve together.



Members of IEEE ComSoc Ecuador, together with representatives of GAD Uyumbicho.

## 2025 IEEE ComSoc eHealth PhD School in Genoa, Italy

### Lecture on Security in WBANs: A New Frontier in Healthcare Innovation

by Lorenzo Mucchi, IEEE ComSoc Distinguished Lecturer, Italy

In the historic port city known for its maritime legacy, a different kind of navigation took center stage at the 2025 IEEE ComSoc eHealth TC PhD School: navigating the future of healthcare through secure wireless technologies. I had the opportunity to present a Distinguished Lecture on *Security for Wireless Body Area Networks (WBANs)*, a topic I've been working on for several years, particularly in the context of physical layer techniques.

The lecture took place in Villa Giustiniani-Cambiaso, a Renaissance villa located in Genoa, now home to the Polytechnic School of the University of Genoa. Designed in 1548 by Galeazzo Alessi for the noble Luca Giustiniani, the villa is a landmark of 16th-century architecture, characterized by its tripartite structure and elegant loggias. If you have ever visited Genoa, you probably remember it more for the alleys where the sun does not give its rays than for the sea that creeps into the city. Genoa has long been a gateway to discovery; its sailors and merchants charted new routes across the Mediterranean and beyond, laying the foundations for global trade and exploration that still echo in the city's cultural and academic life today. The setting offered a unique blend of historical prestige and academic vision, providing an ideal backdrop for discussions on cutting-edge healthcare technologies.

WBANs, comprising wearable and implantable sensors, are becoming increasingly central to modern healthcare systems. They enable continuous monitoring of physiological parameters, such as heart rate and EEG signals, and offer promising solutions for remote assistance and cost reduction. These systems are not only innovative but also becoming essential in addressing the challenges posed by aging populations and the need for sustainable healthcare.

One of the key points I emphasized during the lecture is that security in WBANs cannot rely solely on traditional cryptographic methods. These methods, while effective, are often too demanding for the low-power devices typically used in body area networks. I presented examples of real-world vulnerabilities, including attacks on implanted medical devices and ransomware incidents in hospitals, to illustrate the urgency of the issue.

To address these challenges, I introduced the concept of Physical Layer Security (PLS), which embeds security directly into the transmission process. PLS leverages channel characteristics, noise, and interference to ensure confidentiality without relying on computationally heavy encryption. I used the acoustic phenomenon of Bologna's Voltone del Podestà, where whispers travel along columns but remain inaudible to those in the center, as a metaphor for secure communication at the physical layer.

The lecture included several practical applications of PLS, such as noise-loop modulation for confidentiality, EEG-based authentication, and galvanic coupling, where human tissue itself becomes a secure transmission medium. These techniques are not just theoretical; experimental results and peer-reviewed publications support them. I also envisioned WBANs not just on the body, but inside it, looking ahead in the era of Internet of bio-nano-things, letting the audience insight that security must evolve with technology, and PLS is our compass in this journey.

I also discussed the importance of standardization, highlighting the ETSI SmartBAN initiative, which integrates secure modes and PLS into its framework. This is a crucial step toward ensuring interoperability and widespread adoption of secure WBAN technologies.

From my perspective as a Distinguished Lecturer, the experience was both stimulating and rewarding. It provided a valuable platform to share research, engage with young researchers, and reflect on the broader implications of our work. The DLP program itself is an excellent initiative, as it fosters dialogue across institu-



Villa Giustiniani-Cambiaso in Genoa, Italy



My lecture in Villa Giustiniani.



Voltone del Podestà, Bologna, Italy. An example of physical layer security.

tions and disciplines, helping to bridge the gap between academic research and practical innovation.

As the audience left the lecture hall, I hoped they carried with them not only technical insights but also a sense of the strategic importance of security in healthcare innovation. The future of WBANs is not just about connectivity, it's about trust, resilience, and intelligent design.

## IEEE ComSoc Distinguished Lecture Tour to Canada

### A Tour After IEEE ICC 2025 to Double Information Sharing by Nizar Zorba, IEEE Distinguished Lecturer, Qatar

I successfully completed an IEEE ComSoc Distinguished Lecture Tour (DLT) to Canada in June 2025. The tour followed IEEE ICC 2025 in Montreal, so the exchange of information and ideas was doubled. The tour included four institutions where the audience contributed remarkably insightful ideas, making the exchange of information a genuinely memorable experience."

#### Talks given

In this DLT, I delivered four talks, scheduled as follows:

- Talk one at Concordia University, Montreal-Quebec, hosted by Prof. Chadi Assi, on 13 June 2025.
- Talk 2 at Queen's University, Kingston, Ontario, hosted by Prof. Hossam Hassanein, on 16 June 2025.
- Talk 3 at Waterloo University, Waterloo, Ontario, hosted by Prof. Raouf Boutaba, on 17 June 2025.
- Talk 4 at Western University, London, Ontario, hosted by Prof. Abdallah Shami, on 18 June 2025.

All of my talks had the title of "Beyond the Horizon: Terahertz Communications Inclusion in 6G Networks," where wireless back-haul/fronthaul links are proposed as an alternative for massive deployment of small cells because they are more flexible, easy to deploy, and cost-effective as compared to the traditional optical fiber links. High-frequency millimeter-wave (mmWave) and terahertz (THz) links meet the capacity requirements of next-generation communication networks. However, mmWave/THz links suffer from susceptibility to weather conditions and require a line-of-sight (LoS) connection, which is the main hurdle in urban regions. The utilization of UAVs and HAPS as a wireless fronthaul hub point between small cells and the core network is a promising solution. These vertical-hubs, acting as networked flying platforms (NFPs), provide a possibility of a wireless LoS fronthaul link and thus enable the implementation of mmWave/THz in commercial systems at a fast pace, and are expected to boom in the next few years.

In all talks, recent standardization activities by IEEE ComSoc have been presented, and the audience has been encouraged (especially PhD students) to make their work into IEEE standards. At the end of each talk, I promoted IEEE ComSoc to the audience and explained how the Technical Committees (TCs) can serve as a path to reach standardization activities.

It is impressive to see that each talk attracted many specialized attendees, with special attention to the one at Queen's University,



Happy moments after my lecture: lunch with friends Hossam Hassanein (left) and Hamid Taha (right) in Kingston, Ontario.



Relaxed after the lecture: making the "I" letter in Kingston.

which had more than 50 attendees, including both staff members and research students. It was special as it was part of the WATR workshop, where I gave the talk and later participated as a panelist. Following each presentation, I engaged in thought-provoking discussions with the audience on UAVs, 6G, THz technologies, and the technical aspects covered in my talk. We also explored various pathways to participate in the IEEE standardization process for these emerging fields. I encouraged all attendees to register with IEEE ComSoc and actively contribute to its Technical Committees, fostering their involvement in shaping future standards.

#### BEYOND THE TALKS

I should mention that this trip to Canada was very nice, as it followed the IEEE ICC 2025 conference in Montreal. As the whole duration of my visit (ICC+DLT) was more than 1 week, then a weekend happened in the middle, and it was very convenient to relax. I stayed in Kingston, Ontario, a very nice and small city on the lake, that weekend. I really enjoyed my stay there and went to dinner with friends, as well as did some sightseeing. I was invited to lunch/dinner at all my talks. Even I liked driving between the 4 cities. The road trip was enjoyable. The last day in London, Ontario, was also remarkable, as the host took me on a tour of the city the night before the talk, showing me the city's highlights. The whole country is highly developed and welcoming, and I enjoyed everything in it; I even went shopping during the weekend. All technical and non-technical discussions throughout the visit were both engaging and insightful. I've shared several photos from my talks on LinkedIn, where I reflected on the DLT experience with colleagues and friends around the world, and highlighted the key benefits of the DL program.

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