CONFERENCE PROGRAM

Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

8:30AM - 6:00PM

IN PERSON On Site Registration

EDUNINE 2025
IX IEEE WORLD ENGINEERING EDUCATION CONFERENCE

Montevideo, Uruguay – 23-26 March 2025

IEEE Education Society

COPEC Science and Education Research Organization

ORT UNIVERSIDAD ORT Uruguay

CONFERENCE PROGRAM

Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

9:00AM - 9:45AM

IN PERSON English Plenary #4

Chair: Melany M. Ciampi

The IEEE Education Society: overview and challenges for the future

Argentina 09:00AM	Australia 10:00PM	Bolivia 08:00AM	Brazil 09:00AM	Canada 05:00AM
Chile 09:00AM	China 08:00PM	Colombia 07:00AM	Costa_Rica 06:00AM	Ecuador 07:00AM
Germany 01:00PM	Greece 02:00PM	Guatemala 06:00AM	Indonesia 07:00PM	Ireland 12:00PM
Israel 02:00PM	Mexico 06:00AM	Peru 07:00AM	Philippines 08:00PM	Portugal 12:00PM
Senegal 12:00PM	Spain 01:00PM	Singapore 08:00PM	Sweden 01:00PM	Trinidad_Tobago 08:00AM
Tunisia 01:00PM	United_Kingdom 12:00PM	USA-CDT 08:00AM	USA-PDT 05:00AM	USA-EDT 08:00AM
USA-MDT 06:00AM	USA-HST 02:00AM			

The IEEE Education Society (EdSoc) was founded in 1957 and is one of the oldest technical societies in the IEEE, the Institute of Electrical and Electronics Engineering. It is a worldwide community of professionals dedicated to ensuring high-quality education in science and engineering. The field of interest of EdSoc is the theory and practice of education and educational technology involved in the effective delivery of domain knowledge of all fields within the scope of interest of IEEE. The EdSoc is an international organization that promotes, advances, and disseminates state-of-the-art information and resources related to the Society's field of interest and provides development opportunities for academic, industry and government professionals. The EdSoc strives to be the global leader in engineering education. "The IEEE Education Society: overview and challenges for the future" introduces the IEEE Education Society (Structure, Publications, Conferences, Chapters and Members), focusing on the Latin American region, and deals with the main challenges facing Engineering Education in the future.

Authored by
Martin Llamas Nistal

Presented by

Keynote Speaker: Martin Llamas Nistal

MARTIN LLAMAS NISTAL (M'92-SM'06) received the Eng. and Ph.D. degrees in telecommunication from the Polytechnic University of Madrid, Spain, in 1986 and 1994, respectively. He is Full Professor in the Higher Technical School of Telecommunication Engineers, University of Vigo, Spain. He is author or coauthor of more than 300 papers in peer-reviewed international refereed journals and conference proceedings. He has directed several national and international research projects in telematics and technology enhanced learning fields. He has received several awards from the W3C and from the IEEE. He is very involved in the activities of the IEEE Education Society, serving in different positions: member of the Board of Governors (since 2008) and of the Strategic Planning Committee (since 2009), Chair of the Publications Committee (2010 – 2018), Vice-president for Publications (2011-2018), Vice-president for Member and Geographic Activity (2019-2020), President Elect (2021-2022), President (2023-2024) and currently Jr. Past President (2025-2026). Since April 2020 he is Director of atlanTTic, the Research Center for Telecommunication Technologies of the Universidade de Vigo, Spain.

Session duration: 45 minutes. Join us on time!

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Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

9:45AM - 10:30AM

IN PERSON English Plenary #5

Chair: Claudio R. Brito

The Education of Future: Gen AI empowered and student oriented

Argentina 09:45AM	Australia 10:45PM	Bolivia 08:45AM	Brazil 09:45AM	Canada 05:45AM
Chile 09:45AM	China 08:45PM	Colombia 07:45AM	Costa_Rica 06:45AM	Ecuador 07:45AM
Germany 01:45PM	Greece 02:45PM	Guatemala 06:45AM	Indonesia 07:45PM	Ireland 12:45PM
Israel 02:45PM	Mexico 06:45AM	Peru 07:45AM	Philippines 08:45PM	Portugal 12:45PM
Senegal 12:45PM	Spain 01:45PM	Singapore 08:45PM	Sweden 01:45PM	Trinidad_Tobago 08:45AM
Tunisia 01:45PM	United_Kingdom 12:45PM	USA-CDT 08:45AM	USA-PDT 05:45AM	USA-EDT 08:45AM
USA-MDT 06:45AM	USA-HST 02:45AM			

Embracing AI in modern education is not an option, it is an everyday reality of learning and education. The undeniable power of Generative AI empowers generation of lesson plans, provides inspiration of creativity, and increases productivity. From immediate feedback, to personalized learning, the possibilities of AI powered education seem endless. However, the AI in education cannot be limited to application and usage of AI tools. AI in education must also include education about potential risks of adoption AI technologies. Examples of such risks include but are not limited to privacy and security, but also fairness, potential bias, and an obvious one - reduced human interaction. This interactive talk will start with the foundation of neural networks and deep learning, discuss world trends in AI in education, and provide guidance for responsible use of AI in education.

Authored by
Milos Manic

Presented by

Keynote Speaker: Milos Manic: President of IEEE Industrial Electronics Society (IES)

Dr. Manic is a Professor with the Computer Science Department and Director of VCU Cybersecurity Center at Virginia Commonwealth University. He completed over 50 research grants in AI/ML in cyber and energy and intelligent controls. He authored over 200 refereed articles, has given over 50 invited talks around the world, authored over 200 refereed articles in international journals, books, and conferences, holds several U.S. patents and has won 2018 R&D 100 Award for Autonomic Intelligent Cyber Sensor (AICS), one of top 100 science and technology worldwide innovations in 2018, and is recipient of the 2023 FBI DCLA Director\'s Community Leadership Award for innovative research in AI & cybersecurity. He is an inductee of US National Academy of Inventors (senior class of 2023, member class of 2019), and a Fellow of Commonwealth Cyber Initiative (specialty in AI & Cybersecurity). He holds Joint Appointment with Idaho National laboratory. He is an IEEE IES President (2024-2025), after serving in multiple IES officer positions, IEEE Fellow (for contributions to machine learning based cybersecurity in critical infrastructures), recipient of IEEE IES 2019 Anthony J. Hornfeck Service Award, 2012 J. David Irwin Early Career Award, 2017 IEM Best Paper Award, associate editor of IEEE Transactions on Industrial Informatics, IEEE Open Journal of Industrial Electronics Society, and IEEE IES Senior Life AdCom member. He served as AE of Trans. on Industrial Electronics, was a founding chair of IEEE IES Technical Committee on Resilience and Security in Industry, and was a General Chair of IEEE ICIT 2023, IEEE HSI 2019, and IEEE IECON 2018 (record breaking, over 1,100 participants).

Session duration: 45 minutes. Join us on time!

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Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

10:30AM - 11:00AM

HYBRID Coffee Break

Argentina 10:30AM	Australia 11:30PM	Bolivia 09:30AM	Brazil 10:30AM	Canada 06:30AM
Chile 10:30AM	China 09:30PM	Colombia 08:30AM	Costa_Rica 07:30AM	Ecuador 08:30AM
Germany 02:30PM	Greece 03:30PM	Guatemala 07:30AM	Indonesia 08:30PM	Ireland 01:30PM
Israel 03:30PM	Mexico 07:30AM	Peru 08:30AM	Philippines 09:30PM	Portugal 01:30PM
Senegal 01:30PM	Spain 02:30PM	Singapore 09:30PM	Sweden 02:30PM	Trinidad_Tobago 09:30AM
Tunisia 02:30PM	United_Kingdom 01:30PM	USA-CDT 09:30AM	USA-PDT 06:30AM	USA-EDT 09:30AM
USA-MDT 07:30AM	USA-HST 03:30AM			

Duration: 30 minutes. Join us on time!

CONFERENCE PROGRAM

Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

11:00AM - 12:30PM

HYBRID English Plenary #6

Chair: Claudio R. Brito

Why should we integrate AI into engineering education and research

Argentina 11:00AM	Australia 26 Mar, 12:00AM	Bolivia 10:00AM	Brazil 11:00AM	Canada 07:00AM
Chile 11:00AM	China 10:00PM	Colombia 09:00AM	Costa_Rica 08:00AM	Ecuador 09:00AM
Germany 03:00PM	Greece 04:00PM	Guatemala 08:00AM	Indonesia 09:00PM	Ireland 02:00PM
Israel 04:00PM	Mexico 08:00AM	Peru 09:00AM	Philippines 10:00PM	Portugal 02:00PM
Senegal 02:00PM	Spain 03:00PM	Singapore 10:00PM	Sweden 03:00PM	Trinidad_Tobago 10:00AM
Tunisia 03:00PM	United_Kingdom 02:00PM	USA-CDT 10:00AM	USA-PDT 07:00AM	USA-EDT 10:00AM
USA-MDT 08:00AM	USA-HST 04:00AM			

The capacity of AI systems to automate aspects of knowledge work appears undeniable. It follows, thereby, that AI skills and competencies will be central aspects of engineering work in the next decade, and these capabilities will be expected of engineering graduates. In this talk we will explore the changing face of knowledge work, and the role of education in shaping an AI accelerated future workforce.

Authored by
Arnold Pears

Presented by

Arnold Pears: President of IEEE Education Society (EdSoc)

ARNOLD PEARS BSc(Hons) 1986, PhD 1994, La Trobe Uni., Melbourne, Australia., is Professor and Head of the Department of Learning in Engineering Sciences, KTH Royal Institute of Technology, Stockholm, Sweden. Professor of Computer Science Education at Uppsala University (2017-2023). A highly experienced academic with tertiary education and leadership experience in Australia, France and Sweden, Dr. Pears academic leadership includes two terms in the Uppsala University Academic Senate, serving as Programme Director IT Engineering Uppsala Univ., and providing expert disciplinary education research guidance to TUR the pedagogical advisory council of the Faculty of Technology and Natural Sciences. His contributions to educational innovation and management include multiple terms on the Boards of Studies (TUN and NUN) of Uppsala University (2010-2016), and a term as Head of Education of the Department of Information Technology. Currently he coordinates KTH's participation in 3 Swedish Research Council funded graduate schools, and leads research projects funded by the Swedish government, EU and NordPlus. Publications include 6 book chapters, 40 journal articles and more than 150 refereed conference papers. Citations: 3479, H-index: 28, Google Scholar 11/March/2025

Session duration: 90 minutes. Join us on time!

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Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

12:30PM - 2:30PM

HYBRID Lunch Time

Chair: Alejandro Adorjan Olivera

Argentina 12:30PM	Australia 26 Mar, 01:30AM	Bolivia 11:30AM	Brazil 12:30PM	Canada 08:30AM
Chile 12:30PM	China 11:30PM	Colombia 10:30AM	Costa_Rica 09:30AM	Ecuador 10:30AM
Germany 04:30PM	Greece 05:30PM	Guatemala 09:30AM	Indonesia 10:30PM	Ireland 03:30PM
Israel 05:30PM	Mexico 09:30AM	Peru 10:30AM	Philippines 11:30PM	Portugal 03:30PM
Senegal 03:30PM	Spain 04:30PM	Singapore 11:30PM	Sweden 04:30PM	Trinidad_Tobago 11:30AM
Tunisia 04:30PM	United_Kingdom 03:30PM	USA-CDT 11:30AM	USA-PDT 08:30AM	USA-EDT 11:30AM
USA-MDT 09:30AM	USA-HST 05:30AM			

Duration: 120 minutes

12:30PM - 2:00PM

HYBRID Walking Tour

Chair: Alejandro Adorjan Olivera

Argentina 12:30PM	Australia 26 Mar, 01:30AM	Bolivia 11:30AM	Brazil 12:30PM	Canada 08:30AM
Chile 12:30PM	China 11:30PM	Colombia 10:30AM	Costa_Rica 09:30AM	Ecuador 10:30AM
Germany 04:30PM	Greece 05:30PM	Guatemala 09:30AM	Indonesia 10:30PM	Ireland 03:30PM
Israel 05:30PM	Mexico 09:30AM	Peru 10:30AM	Philippines 11:30PM	Portugal 03:30PM
Senegal 03:30PM	Spain 04:30PM	Singapore 11:30PM	Sweden 04:30PM	Trinidad_Tobago 11:30AM
Tunisia 04:30PM	United_Kingdom 03:30PM	USA-CDT 11:30AM	USA-PDT 08:30AM	USA-EDT 11:30AM
USA-MDT 09:30AM	USA-HST 05:30AM			

Guided Tour
A guided tour led by experts from the Montevideo Tourism Division, covering the city's main points of interest.
. Meeting Point: Universidad ORT (Cuareim 1451)
. Maps: https://maps.app.goo.gl/ sALyoBCPcJzRzUb86
. Start Time: 12:30
. End Time: 14:00

Duration 90 minutes

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Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

2:30PM - 4:00PM

IN PERSON English Technical Session #6

Chair: Daniel Calegari

Argentina 02:30PM	Australia 26 Mar, 03:30AM	Bolivia 01:30PM	Brazil 02:30PM	Canada 10:30AM
Chile 02:30PM	China 26 Mar, 01:30AM	Colombia 12:30PM	Costa_Rica 11:30AM	Ecuador 12:30PM
Germany 06:30PM	Greece 07:30PM	Guatemala 11:30AM	Indonesia 26 Mar, 12:30AM	Ireland 05:30PM
Israel 07:30PM	Mexico 11:30AM	Peru 12:30PM	Philippines 26 Mar, 01:30AM	Portugal 05:30PM
Senegal 05:30PM	Spain 06:30PM	Singapore 26 Mar, 01:30AM	Sweden 06:30PM	Trinidad_Tobago 01:30PM
Tunisia 06:30PM	United_Kingdom 05:30PM	USA-CDT 01:30PM	USA-PDT 10:30AM	USA-EDT 01:30PM
USA-MDT 11:30AM	USA-HST 07:30AM			

Local Time	Presentation	
2:30PM	**Presented by**	**Jorge Mendonça**
	Title:	**Engaging and inspiring primary school students through the 'School Band's project (Paper # 973)**
	Autored by	Carla M.A. Pinto, Lurdes Babo, Jorge Mendonça, Mário Pinto
	Abstract	*This paper examines the impact of implementing a new music education program, the "School Band," in the curricula of students aged 8 to 12 from underprivileged backgrounds. Introduced during the 2020/2021 school year amid COVID-19, the program faced logistical challenges, such as frequent disinfection of wind instruments (e.g., clarinets, saxophones) used by multiple students. The "School Band" fosters interdisciplinary learning, integrates music into students' daily education, and extends its influence to the community through various musical events. A survey collected feedback from 100 participating students to assess the program's impact on their academic and personal growth, with descriptive and inferential statistical analysis employed to interpret the data. Results indicate strong engagement and motivation among students across schools, except in one class, where low agreement was linked to the lack of support from a hesitant head teacher, creating anxiety among students during music sessions.*
		Presentation time 15 minutos and 5 minutes for Q&A
02:50PM	**Presented by**	**Angeles Dominguez**
	Title:	**Strengthening STEM Mentorship for Women: Challenges, Best Practices, and Participant Insights (Paper # 1001)**
	Autored by	Frank E. Melendez-Anzures, Angeles Dominguez, Sonia Perez-Suarez, Ana Zavala-Parrales
	Abstract	*The underrepresentation of women in STEM areas remains a global issue driven by structural, cultural, and institutional barriers. Despite efforts to enhance diversity, women face challenges that limit their participation and advancement. Mentorship has emerged as a powerful intervention, providing support, guidance, and empowerment for women pursuing STEM careers. This study examines these challenges through a qualitative analysis of interviews with eighteen academic women in STEM, revealing gender bias, the lack of visible female role models, and difficulties in balancing personal and professional life. The findings highlight personalized mentorship approaches that reduce isolation and foster professional growth. Mentorship benefits mentees and enhances*

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leadership skills and personal development for mentors, emphasizing the bidirectional nature of the relationship. The study underscores the importance of support networks and continuous training to create inclusive environments that foster diversity and increase women's participation in STEM.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM **Presented by** **Angeles Dominguez**

Title: **Perception of Interdisciplinarity and Thinking Styles in STEM Undergraduate Students (Paper # 1002)**

Autored by Itzel H. Armenta, Jesus Alfonso Beltran-Sanchez, Frank E. Melendez-Anzures, Angeles Dominguez

Abstract *This study investigates the relationship between interdisciplinary perspectives and thinking styles among STEM undergraduate students, emphasizing the role of cognitive preferences in shaping interdisciplinary learning. Engineering students (n=1691) responded to the Interdisciplinarity Perception Test and Sternberg's Thinking Styles Inventory. The main finding of this study is the verification of the positive and statistically significant relationship (p<0.05) between the perception of interdisciplinarity and the thinking styles characterized by cognitive flexibility, creativity, and collaborative preferences. Findings indicate gender-specific variations in interdisciplinary competencies and thinking styles, with women students scoring higher in interdisciplinary perception and reflective behavior. Developmental differences among students were observed, suggesting an institutional impact on cognitive growth as students advance in their program. The study offers practical implications for STEM education by highlighting the need for pedagogical approaches that cultivate interdisciplinary thinking and accommodate diverse cognitive styles, equipping future professionals with the adaptability necessary for tackling complex global challenges.*

Presentation time 15 minutos and 5 minutes for Q&A

03:30PM **Presented by** **Martín Llamas Nistal**

Title: **Work in Progress: Towards an enhanced digitization of course catalogues: the DACEM project (Paper # 1021)**

Autored by Manuel Caeiro-Rodríguez, Martín Llamas-Nistal, Fernando Mikic-Fonte, Adrián Lugilde-López, Martín Liz-Domínguez

Abstract *This research WIP paper describes the DACEM project, aimed at enhancing course catalogues to support the objectives of the Erasmus+ program. Within Erasmus+, course catalogues serve as essential tools for students in their quest for suitable academic opportunities and for institutions in negotiating bilateral agreements on shared programs. Despite numerous initiatives and years of experience, European higher education institutions still face significant challenges in providing appropriate course catalogues, which directly impacts student mobility. This paper conducts an analysis of the current course catalogues situation in 7 European countries (Estonia, France, Greece, Hungary, Portugal, Slovenia, and Spain), examining general trends, the availability of solutions, and key difficulties. Additionally, it evaluates the needs and use cases of end users and stakeholders, highlighting the essential technical features that course catalogue software solutions should encompass. By compiling key requirements, this paper contributes towards the development of appropriate and sustainable course catalogues for Higher Education Institutions.*

Presentation time 15 minutos and 5 minutes for Q&A

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TUESDAY, March 25, 2025

2:30PM - 4:00PM

IN PERSON English Technical Session #7

Chair: Gabriela Dorfman Furman

Argentina 02:30PM	Australia 26 Mar, 03:30AM	Bolivia 01:30PM	Brazil 02:30PM	Canada 10:30AM
Chile 02:30PM	China 26 Mar, 01:30AM	Colombia 12:30PM	Costa_Rica 11:30AM	Ecuador 12:30PM
Germany 06:30PM	Greece 07:30PM	Guatemala 11:30AM	Indonesia 26 Mar, 12:30AM	Ireland 05:30PM
Israel 07:30PM	Mexico 11:30AM	Peru 12:30PM	Philippines 26 Mar, 01:30AM	Portugal 05:30PM
Senegal 05:30PM	Spain 06:30PM	Singapore 26 Mar, 01:30AM	Sweden 06:30PM	Trinidad_Tobago 01:30PM
Tunisia 06:30PM	United_Kingdom 05:30PM	USA-CDT 01:30PM	USA-PDT 10:30AM	USA-EDT 01:30PM
USA-MDT 11:30AM	USA-HST 07:30AM			

Local Time	Presentation
2:30PM	**Presented by** **Eva Christina Andersson** **Title:** **Work in Progress: Adapting eduScrum to the Online Teaching Format (Paper # 931)** **Autored by** Christina Andersson, Gerald Kroisandt **Abstract** *The main idea of agile processes is that they focus on short loops with fast feedback, instead of lengthy projects only evaluated in the end. The agile principles show a lot of promising features, which could be used also in the teaching-learning process, e.g. in the engagement of students. Therefore, the agile manifesto has been successfully mapped to the educational context, giving rise to the pedagogical approach eduScrum. Early applications of eduScrum took place in schools, but it has also been adapted to suit tuition at university level as well. In this paper, we discuss the application of eduScrum in a data science course at university level, both with respect to the face-to-face setting and the current online tuition. We especially focus on challenges and opportunities with the transition of eduScrum to the online environment. Findings in the first in-class usage of the online-taught eduScrum approach are presented.* *Presentation time 15 minutos and 5 minutes for Q&A*
02:50PM	**Presented by** **Gabriela Dorfman Furman, Zeev Weissman** **Title:** **Sequential teaching - enhancing resilience and saving time in an engineering degree program (Paper # 962)** **Autored by** Zeev Weissman, Gabriela Dorfman Furman **Abstract** *This paper considers sequential teaching, an accelerated academic model in which courses are taken one after another rather than in parallel throughout the semester. Sequential teaching can be viewed as a system of intensive, back-to-back courses that streamlines the traditional scheduling format. It is suggested here that this approach offers several advantages. One notable benefit is reducing the overall time to degree by up to 25%. Another is enhancing learning resilience, especially during prolonged emergencies. In this paper, we describe the concept of sequential teaching, analyze these potential benefits, report on a case study we conducted, and discuss some of the broader implications for engineering education.* *Presentation time 15 minutos and 5 minutes for Q&A*

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03:10PM **Presented by** **Emmanuel Sepúlveda Guzmán**

Title: **Implications for an Inclusive Research Environment in Engineering From the Epistemic Experiences of International Students in the U.S. (Paper # 965)**

Autored by Emmanuel Sepúlveda Guzmán, Johannes Strobel, Maartje Van den Bogaard

Abstract *Humility is crucial for learning, enabling students to recognize their limits and remain open to new ideas. Research shows that curiosity fosters question-asking and academic persistence. This exploratory paper studies intellectual humility and curiosity among international engineering students (IES), to further enhance our understanding of their experiences in U.S. higher education. While previous studies have focused on a variety of experiences of international students (IS) in STEM, this paper offers a unique perspective situated around humility and curiosity. The paper builds on earlier research, which elicited that IES view humility and curiosity differently than domestic students. Consequently, a qualitative exploration of the international engineering participants' perspective through analysis of their interviews was chosen. Qualitative findings reveal categories related to how students conceptualize humility and curiosity, emphasizing their learning experiences in engineering as opportunities for open idea exchange and exploration of interests.*

Presentation time 15 minutos and 5 minutes for Q&A

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Education in the Age of Generative AI: Embracing Digital Transformation

TUESDAY, March 25, 2025

2:30PM - 4:00PM

IN PERSON Spanish Technical Session #8

Chairs: Jorge Alvarez Ramírez, Hector Teran, Cecilia Belletti

Argentina 02:30PM	Australia 26 Mar, 03:30AM	Bolivia 01:30PM	Brazil 02:30PM	Canada 10:30AM
Chile 02:30PM	China 26 Mar, 01:30AM	Colombia 12:30PM	Costa_Rica 11:30AM	Ecuador 12:30PM
Germany 06:30PM	Greece 07:30PM	Guatemala 11:30AM	Indonesia 26 Mar, 12:30AM	Ireland 05:30PM
Israel 07:30PM	Mexico 11:30AM	Peru 12:30PM	Philippines 26 Mar, 01:30AM	Portugal 05:30PM
Senegal 05:30PM	Spain 06:30PM	Singapore 26 Mar, 01:30AM	Sweden 06:30PM	Trinidad_Tobago 01:30PM
Tunisia 06:30PM	United_Kingdom 05:30PM	USA-CDT 01:30PM	USA-PDT 10:30AM	USA-EDT 01:30PM
USA-MDT 11:30AM	USA-HST 07:30AM			

Local Time	Presentation	
2:30PM	**Presented by**	**Jorge Alvarez Ramírez**
	Title:	**Educational Innovation in Engineering: Integrating Virtual Reality and Artificial Intelligence in First-Year Student Training (Paper # 936)**
	Autored by	Jorge Alvarez, Fernando de Lima Caneppele, Roberto Gomez Tobias, Cristian Segura-Dominguez, Miriam Navarrete-Bear, Jorge Hidalgo
	Abstract	*This article presents a study on educational innovation that explores the implementation of emerging technologies, specifically Virtual Reality (VR) and Artificial Intelligence (AI), in engineering education. The intervention was conducted with a group of first-year students in an electromagnetics systems course, utilizing the VR application IndustrialVR - Hoover Dam and the AI application VirtualSpeech. Over four weeks, students participated in weekly sessions where these technologies were integrated to complement and enhance theoretical learning. Student perceptions of the immersive VR experience were measured using the Igroup Presence Questionnaire (IPQ), while the acceptance and effectiveness of the AI were evaluated using a Technology Acceptance Model (TAM) questionnaire. The results indicate a high level of immersion and acceptance of the technologies, suggesting their potential as pedagogical tools in engineering education. The implications for future educational applications and the expansion of these technologies are discussed in detail.*
		Presentation time 15 minutos and 5 minutes for Q&A
02:50PM	**Presented by**	**Hector Teran**
	Title:	**Implementing Active Breaks to Reduce Stress in Learning to Program (Paper # 959)**
	Autored by	Hector Teran
	Abstract	*Academic stress negatively impacts students' learning and well-being, especially in demanding courses like Algorithms and Programming, where cognitive demands are high. Chronic stress can impair essential cognitive functions, such as memory, making academic performance challenging. A methodology was developed with an initial literature review to identify effective stress reduction strategies. Based on findings, 8-minute active breaks were incorporated into a three-hour programming class at the beginning, mid-class, and end. The introduction of active breaks led to improvements in concentration, lower stress and fatigue, and enhanced problem-solving and concept retention in programming. Students showed a more positive attitude toward learning*

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programming and greater engagement in class activities. This approach demonstrated that active breaks can effectively reduce stress and improve academic performance. The experience underscores the value of creating a classroom environment that supports both academic growth and emotional well-being.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM **Presented by** **Hugo Pagola**

Title: **Enhancing Cybersecurity Education through Project-Based Learning (Paper # 980)**

Autored by Hugo Pagola, Hernan Merlino, Diego Mazzoni, Javier Vallejos, Pablo Peiretti

Abstract

The project-based learning (PBL) approach is an effective method for developing technical competencies and critical thinking in cybersecurity, a field with rapidly evolving challenges. Building on previous work, this study evaluates the implementation of PBL in the Cryptography and Computer Security course at the Faculty of Engineering, University of Buenos Aires, analyzing its impact on student engagement and learning outcomes. This research identifies best practices for integrating PBL into engineering education. Real-world projects have proven valuable for enhancing learning quality and fostering skills such as creativity, autonomy, collaboration, and problem-solving, contributing to a comprehensive educational experience. The findings show significant improvements in the completion rate and quality of student projects, reinforcing the effectiveness of PBL in preparing future cybersecurity professionals.

Presentation time 15 minutos and 5 minutes for Q&A

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2:30PM - 4:00PM

ONLINE Spanish Technical Session #9

Chair: Ana Luna

Argentina 02:30PM	Australia 26 Mar, 03:30AM	Bolivia 01:30PM	Brazil 02:30PM	Canada 10:30AM
Chile 02:30PM	China 26 Mar, 01:30AM	Colombia 12:30PM	Costa_Rica 11:30AM	Ecuador 12:30PM
Germany 06:30PM	Greece 07:30PM	Guatemala 11:30AM	Indonesia 26 Mar, 12:30AM	Ireland 05:30PM
Israel 07:30PM	Mexico 11:30AM	Peru 12:30PM	Philippines 26 Mar, 01:30AM	Portugal 05:30PM
Senegal 05:30PM	Spain 06:30PM	Singapore 26 Mar, 01:30AM	Sweden 06:30PM	Trinidad_Tobago 01:30PM
Tunisia 06:30PM	United_Kingdom 05:30PM	USA-CDT 01:30PM	USA-PDT 10:30AM	USA-EDT 01:30PM
USA-MDT 11:30AM	USA-HST 07:30AM			

Local Time	Presentation	Speaker Time

2:30PM **Presented by** **Joe Llerena-Izquierdo** **Ecuador 12:30PM**

Title: **Towards an experience of integration of analysis procedures and numerical computation using Blender (Paper # 925)**

Autored by Joe Llerena-Izquierdo, Marlene Mosquera-Gonzalez, Dennis Chang-Pappe, Gilda Lopez-Ruiz

Abstract *Following the COVID-19 pandemic, higher education institutions have adopted various educational strategies incorporating ICT tools into curricular content to enhance understanding of topics such as numerical analysis and problem-solving in areas like chemistry and physics. This paper presents an experience integrating numerical analysis and calculation procedures using the Blender program in a university setting. An empirical-analytical research methodology with a quantitative, quasi-experimental, and longitudinal approach is used. The study involves first-year Multimedia Design students at a polytechnic university in Guayaquil, Ecuador, spanning from May to October 2023, September 2023 to March 2024, and May to October 2024. A survey was conducted with 113 students from the Spatial Geometry course to assess their satisfaction with integrating numerical analysis into 3D modeling. With a 95% confidence level and a 4.5% margin of error, the study finds that Blender integration positively impacts students, with an average satisfaction rate of 79%*

Presentation time 15 minutos and 5 minutes for Q&A

02:50PM **Presented by** **Joe Llerena-Izquierdo** **Ecuador 12:50PM**

Title: **Impact of eXeLearning on Interactive Educational Content in Secondary Education (Paper # 983)**

Autored by Joe Llerena-Izquierdo, Angelica Pombo-Bermeo, Guillermo Pizarro-Vásquez, Hugo Iñiguez-Magallanes

Abstract *The current educational environment requires innovative pedagogical practices that respond to the demands of a digitized society. Therefore, educational institutions seek to train their teachers in the use of digital tools and the generation of educational content and the creation of dynamic, effective and quality teaching environments. This study evaluates the impact of eXeLearning on the creation of interactive teaching resources*

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in secondary education through quasi-experimental research with a quantitative approach. A set of free virtual days of teacher training was proposed, divided into three phases: training sessions, creation of learning objects with eXeLearning and presentation of good practices. The results indicate a positive perception of eXeLearning, highlighting its contribution to digital competencies, quality and efficiency in content creation. In conclusion, eXeLearning is highly accepted and potentially transformative, although it is recommended to improve its practical use in order to optimize its effectiveness in the classroom.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM **Presented by** **Luis Alberto Mendieta Britto** **Peru** **01:10PM**

Title: **How Will Demand for Mining Professionals Increase in Different Areas by 2030? (Paper # 1005)**

Autored by Luis Alberto Mendieta Britto, Oscar Luis Cabello Robles, David Junior Cachay Chavez

Abstract *The rapid advancement in the mining industry poses challenges for educational institutions in training professionals who meet market demands. This study evaluates how demand will increase in key mining areas by 2030, applying the CTWF method based on gray systems theory. Through surveys of international professionals, ten criteria were identified, highlighting growth in Artificial Intelligence, Robotics, and Cybersecurity. On the other hand, a smaller increase is expected in Finance and ESG(Environment, Social Responsability, and Governance). These results will guide the PUCP Mining Section's Career Comittee in updating the curriculum to align with the sector's future needs*

Presentation time 15 minutos and 5 minutes for Q&A

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2:30PM - 4:00PM

ONLINE Spanish Technical Session #10

Chair: Osvaldo Clua

Argentina 02:30PM	Australia 26 Mar, 03:30AM	Bolivia 01:30PM	Brazil 02:30PM	Canada 10:30AM
Chile 02:30PM	China 26 Mar, 01:30AM	Colombia 12:30PM	Costa_Rica 11:30AM	Ecuador 12:30PM
Germany 06:30PM	Greece 07:30PM	Guatemala 11:30AM	Indonesia 26 Mar, 12:30AM	Ireland 05:30PM
Israel 07:30PM	Mexico 11:30AM	Peru 12:30PM	Philippines 26 Mar, 01:30AM	Portugal 05:30PM
Senegal 05:30PM	Spain 06:30PM	Singapore 26 Mar, 01:30AM	Sweden 06:30PM	Trinidad_Tobago 01:30PM
Tunisia 06:30PM	United_Kingdom 05:30PM	USA-CDT 01:30PM	USA-PDT 10:30AM	USA-EDT 01:30PM
USA-MDT 11:30AM	USA-HST 07:30AM			

Local Time	Presentation	Speaker Time
2:30PM	**Presented by** **Félix Melchor Santos López**	Peru 12:30PM
	Title: **Continuous Assessment Teaching in Technology Architecture Course: A Case Study of Learning for Mechatronic Engineering (Paper # 986)**	
	Autored by Franco Rivadeneira, Cristhian Jacinto, Benjamin Alexander Castillo Casanova, Eddy Rodriguez, Angie Celine Pereyra Pacheco, Felix Melchor Santos López	
	Abstract *The COVID-19 pandemic transformed global education, leading to a sudden shift to online classes with minimal preparation, which significantly impacted student engagement. Many students encountered new dynamics that hindered their active participation, particularly in technical subjects. This paper examines effective teaching strategies aimed at enhancing student engagement and ensuring learning continuity despite these challenges. As a result, notable improvements in academic performance and student satisfaction have been observed. For instance, average course grades increased from 14.06 in the first semester of 2023 to 16.58 in the second semester, reflecting substantial progress. Although there was a slight decline to 15.75 in the first semester of 2024, these scores still indicate improvement compared to earlier semesters. Furthermore, the decrease in the standard deviation of laboratory scores—from 6.11 in the second semester of 2023 to 5.37 in the first semester of 2024—suggests a more consistent understanding of the course material among students.*	
	Presentation time 15 minutos and 5 minutes for Q&A	
02:50PM	**Presented by** **Jonathan David Cubillos Oyola, Josimar Dadi Tello Maita, Norma Constanza Barrera Guzn**	Colombia 12:50PM
	Title: **Work in Progress: Integrating Probabilistic Power Flow into Electrical Engineering Education: A Key to Future-Ready Learning (Paper # 1004)**	
	Autored by Norma Constanza Barrera Guzmán, Jonathan David Cubillos Oyola, Josimar Tello-Maita	
	Abstract *This article presents an academic proposal to incorporate probabilistic power flow analysis into the undergraduate electrical engineering program, suggesting its inclusion in the power systems simulation course. Probabilistic power flow enables the study of electrical system behavior under uncertainty, especially relevant with the growing integration of*	

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intermittent renewable energy sources. By developing this topic, the goal is to strengthen students' skills in statistics and data analysis, providing a solid foundation for tackling current challenges in the energy industry. With this training, future engineers will be better prepared to conduct stability and reliability studies in power systems, thereby contributing to the global energy transition. The proposal will include a phased implementation plan, integrating this approach with simulation tools and programming languages, essential for practical skill development in power system analysis.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM **Presented by** **José Fabián Montoya Montoya** **Ecuador 01:10PM**

Title: **DS Generative AI for Supporting Teaching Activities (Paper # 1026)**

Autored by José Fabián Montoya Montoya, Jorge Lopez-Vargas

Abstract

Generative Artificial Intelligence (GAI) has become significant in education, particularly for creating content, resources, and automating repetitive and time-consuming tasks. This project explores GAI's potential to support teachers in analyzing low-to-medium complexity programs of student's tasks, supporting the activities of teachers. The proposed solution includes an API and web application built based on the GPT-4o Large Language Model (LLM), specifically designed for teachers. The methodology begins with a review of relevant literature review to identify scenarios where GAI have shown their potential in the educational field. Subsequently, the performance of the GPT-4o model is evaluated in the context of review and analysis of student's source code, using the Teaching Plans which the task proposals are extracted along with their respective evaluation rubrics, determining the quality and effectiveness of generative AI within this real application.

Presentation time 15 minutos and 5 minutes for Q&A

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2:30PM - 4:00PM

ONLINE Spanish Technical Session #11

Chair: Ulises Ojeda Sánchez, Roberto López

Argentina 02:30PM	Australia 26 Mar, 03:30AM	Bolivia 01:30PM	Brazil 02:30PM	Canada 10:30AM
Chile 02:30PM	China 26 Mar, 01:30AM	Colombia 12:30PM	Costa_Rica 11:30AM	Ecuador 12:30PM
Germany 06:30PM	Greece 07:30PM	Guatemala 11:30AM	Indonesia 26 Mar, 12:30AM	Ireland 05:30PM
Israel 07:30PM	Mexico 11:30AM	Peru 12:30PM	Philippines 26 Mar, 01:30AM	Portugal 05:30PM
Senegal 05:30PM	Spain 06:30PM	Singapore 26 Mar, 01:30AM	Sweden 06:30PM	Trinidad_Tobago 01:30PM
Tunisia 06:30PM	United_Kingdom 05:30PM	USA-CDT 01:30PM	USA-PDT 10:30AM	USA-EDT 01:30PM
USA-MDT 11:30AM	USA-HST 07:30AM			

Local Time	Presentation	Speaker Time

2:30PM **Presented by** **Steven Pacheco-Portuguez** **Costa_Rica 11:30AM**

Title: **Pattern Recognition in programming to support the evaluation of Computational Thinking (Paper # 967)**

Autored by Steven Pacheco-Portuguez, Antonio Gonzalez-Torres, Lilliana Sancho-Chavarria, Ignacio Trejos-Zelaya, Jorge Monge-Fallas

Abstract *Computational thinking is a high-level skill that involves both critical and creative thinking. This research proposes an advanced method for analyzing source code to assess computational thinking skills in elementary school students. We present a large-scale approach that examines source code from various programming exercises using a generalized abstract syntax tree, enabling language-independent analysis. Clustering techniques are applied to identify different levels of computational thinking development in areas such as parallelism, data representation, abstraction and decomposition, control flow, and programming structure. The results of the automated assessment provide insights into students' computational thinking abilities across diverse populations, highlighting opportunities for improving the educational framework.*

Presentation time 15 minutos and 5 minutes for Q&A

02:50PM **Presented by** **Roberto López** **Ecuador 12:50PM**

Title: **Enhancing the student academic profile: trend analysis of technology adoption in automotive engineering (Paper # 970)**

Autored by Roberto Lopez-Chila, Nayelly Mora-Chiquito, Daniel Saavedra-Muñoz

Abstract *This study focuses on the analysis of technology adoption in the Ecuadorian automotive industry, exploring digitalization and its impact on key sectors such as Concessionaries, Auto parts Traders and Car Bodybuilders. Surveys and in depth interviews were used to assess the level of adoption of digital technologies and the training provided by companies to adapt to technological changes. The PRISMA method was applied, which involves the exhaustive identification and rigorous selection of relevant studies, ensuring the validity and reliability of the data collected. The results of the study revealed a positive trend in the adoption of digital technologies, also identified significant areas for improvement,*

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particularly in the adaptation of workers to new technologies. The study's findings underscore the need for robust professional development and technology adaptation strategies to remain competitive in an ever evolving digital environment and the importance of close collaboration between educational institutions and companies to provide continuous training programs.

Presentation time 15 minutos and 5 minutes for Q&A

03:10PM **Presented by** **Ulises Ojeda Sánchez** **Mexico 12:10PM**

Title: **Educational accreditation: A catalyst for poverty reduction in Mexico (Paper # 971)**

Autored by Ulises Ojeda Sánchez, José Manuel Nieto Jalil, Adrián Isrrael Tec Chim, Gustavo Sánchez García, Sofia Carmina López Mata, Juan Manuel Martínez Huerta

Abstract *This study examines the relationship between the Index of Accredited Academic Programs (IPA) and five key economic development variables in Mexico: the poverty index, human development index, competitiveness index, social progress, and poverty. A rigorous statistical analysis applied correlation tests to assess the proposed hypotheses. The results indicate a weak correlation between the IPA and the social lag index, with no significant relationship to the human development and competitiveness indexes. Similarly, no correlation was found between the IPA and social progress. A significant finding, however, is the strong correlation between the IPA and the poverty index. This suggests that the accreditation of academic programs plays a substantial role in reducing poverty across the federal entities in Mexico. This result highlights the importance of accredited higher education as a driver for improving social and economic conditions in the country.*

Presentation time 15 minutos and 5 minutes for Q&A

03:30PM **Presented by** **Katherine Lissett Paredes Guerrero** **Peru 01:30PM**

Title: **Fostering women's retention in Engineering: barriers, success factors and Continuous Education proposals (Paper # 1011)**

Autored by Luis Romero-Untiveros, Juan Lara-Herrera, Julissa Rodriguez-Castro, Katherine Paredes-Guerrero

Abstract *This study explores strategies to foster women's retention in engineering and technology through continuous education programs. The research identifies key barriers, success factors, and practical interventions aimed at supporting women's long-term engagement in STEM fields. Using a pre-program survey, the study evaluates participants' initial interest, self-confidence, and perception of engineering careers. A continuous education program was designed with a focus on hands-on learning, mentoring, and activities highlighting the social impact of engineering. Preliminary results suggest that interventions targeting both technical skills and social integration can significantly improve retention. Future work includes a post-program evaluation and an annual follow-up to measure the long-term effects on participants' confidence, persistence in engineering programs, and sense of belonging in STEM environments*

Presentation time 15 minutos and 5 minutes for Q&A

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TUESDAY, March 25, 2025

03:50PM **Presented by** **Katherine Lissett Paredes Guerrero** **Peru 01:30PM**

Title: **Fostering women's retention in Engineering: barriers, success factors and Continuous Education proposals (Paper #)**

Autored by Luis Romero-Untiveros, Juan Lara-Herrera, Julissa Rodriguez-Castro, Katherine Paredes-Guerrero

Abstract *This study explores strategies to foster women's retention in engineering and technology through continuous education programs. The research identifies key barriers, success factors, and practical interventions aimed at supporting women's long-term engagement in STEM fields. Using a pre-program survey, the study evaluates participants' initial interest, self-confidence, and perception of engineering careers. A continuous education program was designed with a focus on hands-on learning, mentoring, and activities highlighting the social impact of engineering. Preliminary results suggest that interventions targeting both technical skills and social integration can significantly improve retention. Future work includes a post-program evaluation and an annual follow-up to measure the long-term effects on participants' confidence, persistence in engineering programs, and sense of belonging in STEM environments*

Presentation time 15 minutos and 5 minutes for Q&A

4:00PM - 4:30PM

HYBRID

Argentina 04:00PM	Australia 26 Mar, 05:00AM	Bolivia 03:00PM	Brazil 04:00PM	Canada 12:00PM
Chile 04:00PM	China 26 Mar, 03:00AM	Colombia 02:00PM	Costa_Rica 01:00PM	Ecuador 02:00PM
Germany 08:00PM	Greece 09:00PM	Guatemala 01:00PM	Indonesia 26 Mar, 02:00AM	Ireland 07:00PM
Israel 09:00PM	Mexico 01:00PM	Peru 02:00PM	Philippines 26 Mar, 03:00AM	Portugal 07:00PM
Senegal 07:00PM	Spain 08:00PM	Singapore 26 Mar, 03:00AM	Sweden 08:00PM	Trinidad_Tobago 03:00PM
Tunisia 08:00PM	United_Kingdom 07:00PM	USA-CDT 03:00PM	USA-PDT 12:00PM	USA-EDT 03:00PM
USA-MDT 01:00PM	USA-HST 09:00AM			

Duration: 30 minutes. Join us on time!

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4:30PM - 6:00PM

IN PERSON English Technical Session #12

Chairs: Nuno Pombo

Argentina 04:30PM	Australia 26 Mar, 05:30AM	Bolivia 03:30PM	Brazil 04:30PM	Canada 12:30PM
Chile 04:30PM	China 26 Mar, 03:30AM	Colombia 02:30PM	Costa_Rica 01:30PM	Ecuador 02:30PM
Germany 08:30PM	Greece 09:30PM	Guatemala 01:30PM	Indonesia 26 Mar, 02:30AM	Ireland 07:30PM
Israel 09:30PM	Mexico 01:30PM	Peru 02:30PM	Philippines 26 Mar, 03:30AM	Portugal 07:30PM
Senegal 07:30PM	Spain 08:30PM	Singapore 26 Mar, 03:30AM	Sweden 08:30PM	Trinidad_Tobago 03:30PM
Tunisia 08:30PM	United_Kingdom 07:30PM	USA-CDT 03:30PM	USA-PDT 12:30PM	USA-EDT 03:30PM
USA-MDT 01:30PM	USA-HST 09:30AM			

Local Time	Presentation	
4:30PM	**Presented by**	**Nuno Pombo**
	Title:	**Integrating Long-Term Future Scenarios to Develop Soft Skills (Paper # 968)**
	Autored by	Nuno Pombo
	Abstract	*This study explores the use of futuristic scenario-based activities to enhance soft skills in education, targeting skills such as creativity, adaptability, and strategic thinking. Involving 44 participants, the research incorporated immersive, interactive sessions on Long-Term Future Scenarios, leading to substantial improvements in students' understanding and application of these skills, as evidenced by pre- and post-experiment questionnaires. Findings revealed that while over 89\% of participants acknowledged the importance of futuristic thinking for academic and career advancement, only 20\% had prior exposure to it, highlighting a gap in current educational practices. The study emphasizes the value of a well-resourced learning environment and expert facilitators for effective skill development. High participant satisfaction and positive skill acquisition suggest these methods hold potential, especially in STEM education, for better equipping students to meet evolving workforce demands. Future research should examine the long-term impact and broader application of these approaches.*
		Presentation time 15 minutos and 5 minutes for Q&A
04:50PM	**Presented by**	**Cesar A. Santivanez**
	Title:	**LoFi5G MAT: a Low-cost, High-fidelity 5G Virtualized Testbed for Academic Purposes (Paper # 1016)**
	Autored by	Ronny E. Pastor, Agustin J. Vizcarra, Cesar A. Santivanez, Jose V. Rodriguez
	Abstract	*This work presents a flexible and adaptable, Low-cost, high-Fidelity 5G Mobile network Academic Testbed (LoFi5G MAT) for use in undergraduate teaching and research projects. LoFi5G MAT is integrated with HAST, our department's OpenStack-based private cloud, which enables resource sharing between various workloads of our department while managing different priorities and fidelity requirements. LoFi5G MAT is designed to emulate mobile network elements for 4G and 5G core and RAN scenarios suited to undergraduate laboratories, as well as paradigms such as SBA, CUPS, network slicing, and merging technologies such as Open-RAN. Through its use, students can acquire hands-on knowledge, understanding key functionalities and their relevance. This work also presents and analyzes our students' experiences using LoFi5G MAT at the end-of-career mobile networks course during the 2024-1 semester,*

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showing a significant improvement (22%) in the associated students' outcomes, which demonstrate its value in undergraduate teaching

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Presented by** **Gustavo Adolfo Siles Soria**

Title: **IoT capacity building in Bolivia: learnings from a flipped and hands-on short course on LoRaWAN (Paper # 1028)**

Autored by Gustavo A. Siles, Santiago Fuentes, Cristian Salazar

Abstract

The Internet of Things is the current paradigm allowing massive data from physical devices to be gathered using sensors. The collected information can be sent over the Internet and become useful input for decision making. This paper reports a first experience teaching LoRaWAN technology in the frame of an IoT short course in the Radiocommunications Laboratory at Universidad Privada Boliviana (UPB), developed in response to recent spectrum regulations in Bolivia. The course is based on a hybrid methodology, theoretical concepts were developed through off line video-based lectures and in-person sessions were focused on instructor-led hands-on laboratories helping to improve the learning experience of the students. A Likert scale satisfaction survey is used to evaluate participants' perceptions of the learning process. This paper offers insights into designing introductory LoRaWAN courses, particularly for instructors aiming to teach IoT concepts through practical applications using off-the-shelf devices and a TTN-based server.

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM **Presented by** **Antonio Maffei**

Title: **Detecting Large Language Models in Exam Essays (Paper # 979)**

Autored by Andrea De Giorgio, Giacomo Matrone, Antonio Maffei

Abstract

There is a widespread fear that large language models (LLMs) produce content that is indistinguishable from an original human work. Can students use LLM-based tools for their exam essays without being spotted? We performed experiments on a publicly available dataset that we produced, containing thirty answers provided by ChatGPT and thirty-six answers from university students, for each of six anonymized exam essay traces from a scientific methodology course for engineers. We applied term frequency-inverse document frequency (TF-IDF), a state-of-the-art machine learning algorithm for natural language processing, and the cosine similarity metric, in order to produce two LLM detectors. One is based on one-class support vector machine anomaly detection, and the other is based on multi-class random forest classification. The results show that it is possible to spot when LLMs are involved, provided that the source LLM is known. Education institutions can follow our guidelines to prevent cheating and improve education.

Presentation time 15 minutos and 5 minutes for Q&A

EDUNINE 2025
IX IEEE WORLD ENGINEERING EDUCATION CONFERENCE

Montevideo, Uruguay – 23-26 March 2025

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4:30PM - 6:00PM

IN PERSON Spanish Technical Session #13

Chairs: José-Martín Molina-Espinosa, Gerardo Matturro

Argentina 04:30PM	Australia 26 Mar, 05:30AM	Bolivia 03:30PM	Brazil 04:30PM	Canada 12:30PM
Chile 04:30PM	China 26 Mar, 03:30AM	Colombia 02:30PM	Costa_Rica 01:30PM	Ecuador 02:30PM
Germany 08:30PM	Greece 09:30PM	Guatemala 01:30PM	Indonesia 26 Mar, 02:30AM	Ireland 07:30PM
Israel 09:30PM	Mexico 01:30PM	Peru 02:30PM	Philippines 26 Mar, 03:30AM	Portugal 07:30PM
Senegal 07:30PM	Spain 08:30PM	Singapore 26 Mar, 03:30AM	Sweden 08:30PM	Trinidad_Tobago 03:30PM
Tunisia 08:30PM	United_Kingdom 07:30PM	USA-CDT 03:30PM	USA-PDT 12:30PM	USA-EDT 03:30PM
USA-MDT 01:30PM	USA-HST 09:30AM			

Local Time	Presentation	
4:30PM	**Presented by**	**Genaro Zavala, Rodrigo Andres Valdés Guajardo**
	Title:	**Collaborative Learning in Engineering Education: Fostering 21st-Century Skills (Paper # 966)**
	Autored by	Rodrigo Valdés Guajardo, Angeles Dominguez, Genaro Zavala
	Abstract	*This study examines the impact of active and collaborative pedagogies on developing 21st-century skills in engineering students. A structured instructional sequence based on cooperative learning was implemented to enhance communication, teamwork, and critical thinking. Standardized assessments, including the Force Concept Inventory (FCI), the CHAC Questionnaire, and the ACOES Questionnaire, demonstrated gains in conceptual understanding and interpersonal skills. However, despite developing strong collaborative abilities, students rated the value of teamwork lower (M = 3.3), indicating a disconnect between skill acquisition and its perceived relevance. The findings also emphasize responsibility, equity, trust, and commitment as key factors in effective collaboration. Peer evaluation, role rotation, and formative feedback can enhance participation equity and teamwork perception. This study highlights the potential of active methodologies in globalized, multidisciplinary engineering education and suggests areas for instructional improvement. Future research should explore their adaptation to diverse educational settings and integration with traditional instruction for a broader impact.*
		Presentation time 15 minutos and 5 minutes for Q&A
04:50PM	**Presented by**	**José-Martín Molina-Espinosa**
	Title:	**Decision Trees as a Tool for Promoting Inclusion and Diversity in Adaptive Education (Paper # 1012)**
	Autored by	José-Martín Molina-Espinosa, Ignacio Alvarado Reyes, Inés Alvarez-Icaza Longoria, Paloma Suárez-Brito
	Abstract	*Inclusion in education is critical to achieving Sustainable Development Goal 4, which ensures equitable education for all. This study explores the application of decision tree algorithms to improve adaptive education, promoting inclusion and diversity in higher education. Decision trees were used to classify students into predefined categories based on various attributes such as gender, age, learning styles, and specific needs (for example, ADHD). The algorithm was trained on an experimental dataset and demonstrated high accuracy (95.94%) in classification. By dynamically adjusting*

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educational content and accessibility options, this approach aims to provide personalized learning experiences tailored to individual needs. The findings highlight the potential of AI-driven adaptive learning systems to improve educational outcomes and foster an inclusive environment by accommodating various learning preferences and requirements. This research contributes to a greater understanding of how technology can be used to address educational inequities and suggests future directions to improve adaptive learning frameworks.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Presented by** **Jessica Alejandra Ruiz Ramirez**

Title: **Gamified Simulators and EEG: Exploring the Relationship Between Concentration and Socio-Emotional Skills Learning (Paper # 1043)**

Autored by Sergio Noé Torres Rodríguez, Jessica Alejandra Ruiz Ramirez, Luis Fernando Morán Mirabal, Ramon Daniel Castillo Guevara

Abstract

This pilot study investigates the role of concentration, as measured through EEG, in the development of socio-emotional skills within gamified simulation environments. Utilizing real-time monitoring, concentration indicators were analyzed to evaluate their relationship with key performance metrics, including satisfaction and overall task performance. Results indicate that higher concentration levels correlate positively with both performance and user satisfaction, highlighting the potential of EEG monitoring to optimize adaptive learning models by dynamically adjusting content based on cognitive states. The study contributes to the field by providing insights into how concentration impacts learning in simulated educational settings, suggesting that cognitive feedback can enhance the personalization and effectiveness of simulation-based education. Limitations include the small sample size and the use of a single EEG device, which may affect the generalizability of findings. Future research should explore integrating additional cognitive biomarkers and expand this approach across various educational contexts to validate the applicability and scalability of adaptive learning systems.

Presentation time 15 minutos and 5 minutes for Q&A

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4:30PM - 6:00PM

ONLINE English Technical Session #14

Chair: Crista Mohammed

Argentina 04:30PM	Australia 26 Mar, 05:30AM	Bolivia 03:30PM	Brazil 04:30PM	Canada 12:30PM
Chile 04:30PM	China 26 Mar, 03:30AM	Colombia 02:30PM	Costa_Rica 01:30PM	Ecuador 02:30PM
Germany 08:30PM	Greece 09:30PM	Guatemala 01:30PM	Indonesia 26 Mar, 02:30AM	Ireland 07:30PM
Israel 09:30PM	Mexico 01:30PM	Peru 02:30PM	Philippines 26 Mar, 03:30AM	Portugal 07:30PM
Senegal 07:30PM	Spain 08:30PM	Singapore 26 Mar, 03:30AM	Sweden 08:30PM	Trinidad_Tobago 03:30PM
Tunisia 08:30PM	United_Kingdom 07:30PM	USA-CDT 03:30PM	USA-PDT 12:30PM	USA-EDT 03:30PM
USA-MDT 01:30PM	USA-HST 09:30AM			

Local Time	Presentation	Speaker Time

4:30PM **Presented by** **Crista Mohammed** **Trinidad_Tobago 03:30PM**

Title: **Work in Progress: A Rapid Review of the Scholarship on Generative AI in Engineering Workplaces: Implications for Engineering Education (Paper # 1017)**

Autored by Crista Mohammed

Abstract

If engineering programs are to be fit for purpose, they must be informed by actual engineering workplace practices. A rapid review was employed to investigate how, according to the scholarship, GAI is being used in engineering workplaces. The selection of scholarship was informed by PRISMA guidelines. Seven articles met the inclusion criteria. Scholars are advocating for centering human agency in the deployment of GAI. The scholarship reports generic uses of GAI in engineering and uses specific to civil and software engineering. This review provides several take-aways for educators and researchers: the ethics of GAI use must figure in curricula; engineering classrooms must foster GAI literacy; and there is need for more research on GAI deployment in the workplace. Also, distinctions are needed between industrial AI and GAI. While students will eventually use industrial AI in the workplace, it is GAI that they are leveraging in the classroom.

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Presented by** **Marco Monge** **Peru 02:50PM**

Title: **A Blueprint for Sustainable Design and Building Education using SDGs (Paper # 1038)**

Autored by Cristina Dreifuss-Serrano, Marco Monge, Vivian López-Vallejos

Abstract

By assessing awareness and the application of ethical approaches with the framework of SDGs, educators can cultivate a holistic view of design as a powerful tool for addressing global challenges. We propose an assessment tool composed of competencies linked to SDGs, criteria and indicators, to be systematically and progressively applied in Problem-Based Learning environments, in schools of design, architecture and building disciplines. Reviewing current literature and focusing on over 900 outcomes of PBL experiences, we propose a systematic incorporation of SDGs in teaching

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and evaluating higher education outcomes, in a way that is deeply interlinked with professional skills.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Presented by** **Ernesto Pacheco-Velazquez** **Mexico 02:10PM**

Title: **Towards Effective Serious Game Design: A Proposed Scale to Identify Essential User Satisfaction Attributes (Paper # 1044)**

Autored by Ernesto Pacheco-Velazquez, Astrid Xiomara Rodriguez-Castelblanco

Abstract *Video games have evolved into a widely popular form of entertainment in today's society. Furthermore, in recent years, the use of serious games in educational environments has gained considerable relevance, standing out as innovative tools for learning and motivation. This article proposes an evaluation scale to measure user satisfaction in serious games, integrating a diverse set of essential attributes such as immersion, concentration, clarity of objectives, autonomy, social interaction, knowledge enhancement, and emotional involvement, among others. These factors aim to capture different aspects of the gaming experience that are relevant to maximizing both educational effectiveness and the general appeal of serious games. While this study focuses on developing a comprehensive scale that encompasses a broad range of attributes, future research will explore which factors are most significant according to the specific characteristics of each type of serious game. This proposal provides a methodological foundation for designers and educators to create more effective and rewarding gaming experiences.*

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM **Presented by** **Ernesto Pacheco-Velazquez** **Mexico 02:30PM**

Title: **Development of a Logistics Simulator for Education and Training in Industry 4.0 (Paper # 1045)**

Autored by Ernesto Pacheco-Velazquez, Astrid Xiomara Rodriguez-Castelblanco, Sergio Ramirez-Echeverri

Abstract *This study explores the role of simulators and games in logistics training, focusing on their integration with Industry 4.0 technologies. It emphasizes the importance of these tools in developing skills and insights into complex logistics systems. The paper highlights the need for logistics professionals to gain specialized knowledge, from supply chain fundamentals to risk management. It outlines key characteristics of an effective logistics simulator and the necessary skills and technical knowledge for professionals in the field. The study details the development of a simulator that simulates the entire supply chain process, offering customizable scenarios to meet various business needs. The design allows users to modify logistics networks, define relationships between goods, and set characteristics for different actors, providing a comprehensive tool for navigating logistics operations.*

Presentation time 15 minutos and 5 minutes for Q&A

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TUESDAY, March 25, 2025

4:30PM - 6:00PM

ONLINE English Technical Session #15

Chair: Ana Luna

Argentina 04:30PM	Australia 26 Mar, 05:30AM	Bolivia 03:30PM	Brazil 04:30PM	Canada 12:30PM
Chile 04:30PM	China 26 Mar, 03:30AM	Colombia 02:30PM	Costa_Rica 01:30PM	Ecuador 02:30PM
Germany 08:30PM	Greece 09:30PM	Guatemala 01:30PM	Indonesia 26 Mar, 02:30AM	Ireland 07:30PM
Israel 09:30PM	Mexico 01:30PM	Peru 02:30PM	Philippines 26 Mar, 03:30AM	Portugal 07:30PM
Senegal 07:30PM	Spain 08:30PM	Singapore 26 Mar, 03:30AM	Sweden 08:30PM	Trinidad_Tobago 03:30PM
Tunisia 08:30PM	United_Kingdom 07:30PM	USA-CDT 03:30PM	USA-PDT 12:30PM	USA-EDT 03:30PM
USA-MDT 01:30PM	USA-HST 09:30AM			

Local Time	Presentation	Speaker Time

4:30PM **Presented by** **Claudio Cesar Silva de Freitas** **USA-EDT 03:30PM**

Title: **Using Inquisitive AI Feedback to Enhance Formative Assessment in First-Year Engineering (Paper # 940)**

Autored by Claudio de Freitas

Abstract

Effective formative feedback is essential in first-year engineering (FYE) education to foster critical thinking and support students in navigating engineering tasks. This paper introduces the Inquisitive AI feedback system combined with a cyber-physical system (CPS), designed to enhance formative feedback through inquisitive prompts during lab activities. The system offers immediate, personalized feedback, assisting students in understanding and engaging with complex simulations. Preliminary results from a pilot study involving 24 students (eight groups of three) demonstrate the system's potential to improve formative assessment by clarifying misconceptions, enhancing time efficiency, and reducing the dependency on instructor intervention. However, further development is necessary in key areas: (1) enhancing the AI's contextual understanding of student activities, (2) improving the clarity of feedback provided, (3) guiding students on effective engagement with the AI, and (4) creating individualized student profiles to address critical learning gaps essential for lab success.

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Presented by** **Claudio Cesar Silva de Freitas** **USA-EDT 03:50PM**

Title: **Scaffolding Storytelling in Project-Based Learning using Learning Management Systems: A Case Study (Paper # 978)**

Autored by Claudio de Freitas

Abstract

This research explores how Learning Management Systems (LMSs) can facilitate the implementation of storytelling in project-based learning, with a focus on a first-year engineering (FYE) course. To address this objective, we propose a teaching approach that integrates pedagogical tasks into the Brightspace LMS, grounded in a story-based approach. A case study was conducted to evaluate the LMS's effectiveness in supporting both teaching and learning processes. Specifically, this study examines how the teaching model integrated with LMS scaffolds student engagement, promotes

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collaboration and deepens understanding of key engineering concepts. The findings indicate that LMSs, when strategically aligned with pedagogy, can transform classroom dynamics by fostering interactive, student-centered learning environments that reflect real-world engineering practices. This research underscores the value of maximizing LMS functionalities beyond basic content delivery, bridging gaps identified in prior studies regarding the limited use of LMS features in engineering education.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Presented by** **Samiya Qasmi** **USA-EDT 04:10PM**

Title: **Work in Progress: Development of a Modular and Integrated Electronic Kit for First-Year Engineering (Paper # 1024)**

Autored by Samiya Qasmi, Claudio de Freitas

Abstract

This paper presents the Portable Engineering Experimenter Board (PEEB), a custom-designed laboratory kit developed for first-year engineering students to foster foundational engineering skills. With an integrated, modular approach, PEEB empowers students to explore digital logic, analog and digital sensors, breadboarding, and programming in a cohesive learning environment. This study contributes to the literature by demonstrating the design and classroom integration of custom-built technology within a spiral curriculum framework, enhancing concept reinforcement over time. Findings provide insights from a teaching perspective on its effectiveness in promoting hands-on learning and achieving learning outcomes.

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM **Presented by** **Michael P Verdicchio** **USA-EDT 04:30PM**

Title: **Adapting Program Assessment for the Age of Generative AI (Paper # 1041)**

Autored by Michael Verdicchio

Abstract

Program assessment practices not designed to account for student use of generative AI have the potential to mislead as to the perceived degree of student outcome attainment in all STEM fields. Understanding how AI tools like ChatGPT and GitHub Copilot have impacted student approaches to problem solving will allow us to design and deploy more effective assessment instruments and collect more meaningful data. An assessment plan structured according to ABET accreditation criteria has opportunities at several levels to make meaningful adjustments. This work summarizes recent literature and best practices in program assessment. Next, it offers suggestions for adaptations from the assessment perspective, along with the course-level perspective. Finally, an experience report describing efforts to account for student use of generative AI is provided, along with example assignments, which are described with instructor and student perspectives. The experience is then generalized for ETC education with recommendations for other programs to follow.

Presentation time 15 minutos and 5 minutes for Q&A

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TUESDAY, March 25, 2025

05:50PM **Presented by** **Eric Peterson, Shahin Vassigh** **USA-HST 10:50AM**

Title: **Work in Progress: Developing an AI-Enhanced Immersive Curriculum for Environmental Robotics (Paper # 1034)**

Autored by Eric Peterson, Biayna Bogosian, Shahin Vassigh, Gregory Murad-Reis, Agoritsa Polyzou, Bhavleen Kaur Narula

Abstract *Abstract— A convergence of technology advancements including spatial computing, augmented reality (AR), and artificial intelligence (AI) can now support the personalization of learning environments and dynamically respond to learner performance data with personalized feedback. Augmented Learning for Environmental Robotics (ALERT), leverages advances in technology to research, develop, and test an augmented reality-enhanced (AR) curriculum for learning how to develop and use robotic environmental monitoring tools for collecting data on environmentally sensitive construction sites. With this project, our research team aims to develop the ALERT curriculum as an immersive learning environment, implement automation processes that dynamically adjust to learner performance, and address a pressing problem in the construction sector with recent advances in small robotics and remote sensing.*

Presentation time 15 minutos and 5 minutes for Q&A

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TUESDAY, March 25, 2025

4:30PM - 6:00PM

ONLINE Spanish Technical Session #16

Chair: Agatha Clarice da Silva Ovando

Argentina 04:30PM	Australia 26 Mar, 05:30AM	Bolivia 03:30PM	Brazil 04:30PM	Canada 12:30PM
Chile 04:30PM	China 26 Mar, 03:30AM	Colombia 02:30PM	Costa_Rica 01:30PM	Ecuador 02:30PM
Germany 08:30PM	Greece 09:30PM	Guatemala 01:30PM	Indonesia 26 Mar, 02:30AM	Ireland 07:30PM
Israel 09:30PM	Mexico 01:30PM	Peru 02:30PM	Philippines 26 Mar, 03:30AM	Portugal 07:30PM
Senegal 07:30PM	Spain 08:30PM	Singapore 26 Mar, 03:30AM	Sweden 08:30PM	Trinidad_Tobago 03:30PM
Tunisia 08:30PM	United_Kingdom 07:30PM	USA-CDT 03:30PM	USA-PDT 12:30PM	USA-EDT 03:30PM
USA-MDT 01:30PM	USA-HST 09:30AM			

Local Time	Presentation	Speaker Time

4:30PM **Presented by** **Juan Gabino Díaz Martínez** **Mexico 01:30PM**

Title: **Work in Progress. Fun with Industrial Automation: Hands-On Learning Ladder Logic with LogixPro 500 Simulator (Paper # 1008)**

Autored by Juan-Gabino Díaz-Martínez, Irandi Gutiérrez-Carmona, Raco-Daniel Arteaga-Jiménez

Abstract *Automation plays an important and irreplaceable part in many modern industries, where automated control systems gather, analyze, and respond to information almost autonomously to increase productivity. The goal of this project is to use the LogixPro 500 PLC simulator to teach ladder logic programming to students in the sixth term of the Mechatronics Engineering program easily and interactively by using reallife industrial process simulations. Students learn in a gamified environment by designing, implementing, and fixing automation systems. We covered electrical circuit wiring, timers, counters, and shift registers while evaluating the motivation and engagement of students using the MDI-EE and MUSIC instruments.*

Presentation time 15 minutos and 5 minutes for Q&A

04:50PM **Presented by** **Lourdes Socarrás** **Bolivia 03:50PM**

Title: **EU-BEGP: Building a Common Framework for Digital Education Credentials in Latin America (Paper # 1022)**

Autored by Lourdes Socarrás-Mérida, Alex Villazón, Carlos Armando Lemus Montepeque, Cristian Fernando Guzmán, Omar Ormachea, Sebastián Cabria Vissoni, Torsten Fransson, Agatha da Silva-Ovando

Abstract *To overcome obstacles due to the absence of uniform academic credit systems among institutions, the EU-BEGP project proposes a unified qualification framework compatible with both the European Credit Transfer and Accumulation System (ECTS) and the Latin American Reference Credit (CLAR) system. Introducing the concept behind the EXPLORE Energy Digital Academy (EEDA), the project encourages international cooperation co-creating digital learning resources, with a focus on quality control and creative models that have been extended throughout Latin America. This initiative entails institutions from Europe and Latin America aiming to modernize energy-related programs using digital tools while suggesting*

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alternatives for a unified credit system, making it easier for credentials to be recognized across regions. This paper analyzes the collaborative framework prioritizing the structural academic metadata, educational quality standards, and mechanisms for credit transfer among institutions, including the use of the Stackable Master Credit Transfer System (SMCTS), an informal credit system used within EEDA.

Presentation time 15 minutos and 5 minutes for Q&A

05:10PM **Presented by** **Oscar Luis Cabello Robles** **Peru 03:10PM**

Title: **Design and Implementation of a Capstone Project Course for a Mining Engineering Degree Program (Paper # 1027)**

Autored by Oscar Luis Cabello Robles, Luis Alberto Mendieta Britto

Abstract *The Mining Engineering section of PUCP initiated an accreditation plan with ABET, which it successfully passed. However, among the recommendations provided by the accrediting agency was the suggestion to include a capstone project course. In response, a new capstone project course had to be created that meets the competencies established by PUCP and ABET. Students should apply the knowledge acquired in all courses throughout their studies, in addition to considering the needs of the mining industry. This article outlines the methodology and stages employed in the creation, implementation, and subsequent evaluation rubrics for the capstone project course. To this end, a focus group was held in 2023 with professionals and academics from the mining industry to align market requirements with the competencies that a graduate in Mining Engineering should possess. Subsequently, the course was introduced in the first semester of 2024 and evaluated by the Career Committee of the PUCP Mining Engineering Section. Finally, the best projects were presented at XPOSTEM, a science fair organized by the Faculty of Science and Engineering to showcase the best projects from various engineering programs.*

Presentation time 15 minutos and 5 minutes for Q&A

05:30PM **Presented by** **Wilson Eduardo Soto Forero** **Colombia 03:30PM**

Title: **Tool-Based Retrieval-Augmented Generative as an Automated Assistant in Object-Oriented Programming Course (Paper # 994)**

Autored by Wilson Soto

Abstract *The integration of artificial intelligence into educational tools is transforming learning environments. In computer science, students frequently encounter challenges with complex concepts and practical applications. While LLMs offer valuable support, their responses can sometimes lack precision or rely on outdated information. Addressing these limitations is essential to enhance the effectiveness of AI-based tools in educational support. The main objective of this paper is to propose a toolbased RAG as automated assistant in an OOP Course. The tool was tested using common student queries and its responses were compared with those generated by ChatGPT. Initial observations suggest that RAG consistently generated contextually relevant responses due to its ability to access pertinent information from a structured knowledge base, resulting in more precise and applicable answers for students. The introduction of a RAG-based tool*

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in classrooms has the potential to enhance student learning by providing instant, tailored responses to specific queries.

Presentation time 15 minutos and 5 minutes for Q&A

8:00PM - 10:00PM

HYBRID Banquet

Chair: Alejandro Adorjan Olivera

Argentina 08:00PM	Australia 26 Mar, 09:00AM	Bolivia 07:00PM	Brazil 08:00PM	Canada 04:00PM
Chile 08:00PM	China 26 Mar, 07:00AM	Colombia 06:00PM	Costa_Rica 05:00PM	Ecuador 06:00PM
Germany 26 Mar, 12:00AM	Greece 26 Mar, 01:00AM	Guatemala 05:00PM	Indonesia 26 Mar, 06:00AM	Ireland 11:00PM
Israel 26 Mar, 01:00AM	Mexico 05:00PM	Peru 06:00PM	Philippines 26 Mar, 07:00AM	Portugal 11:00PM
Senegal 11:00PM	Spain 26 Mar, 12:00AM	Singapore 26 Mar, 07:00AM	Sweden 26 Mar, 12:00AM	Trinidad_Tobago 07:00PM
Tunisia 26 Mar, 12:00AM	United_Kingdom 11:00PM	USA-CDT 07:00PM	USA-PDT 04:00PM	USA-EDT 07:00PM
USA-MDT 05:00PM	USA-HST 01:00PM			

Join Us for a Fun and Traditional Dinner!
We invite all participants to an informal and lively dinner at a traditional local venue, where we can relax, enjoy great food, and share a fun evening together. It's a wonderful opportunity to connect with colleagues in a friendly and casual atmosphere.
Everyone covers their own meal.
Details about the location and time are available at the registration desk.
Come for the food, stay for the great company—we look forward to seeing you there!
. Meeting Point: Universidad ORT (Cuareim 1451)
. Maps: https://maps.app.goo.gl/sALyoBCPcJzRzUb86
. Start Time: 20:00
. End Time: 21:30
. Banquet Venue: TBD
Note: The conference banquet is not covered by the University.