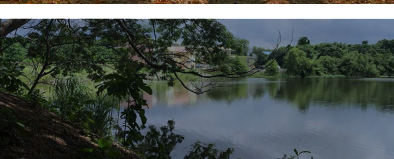
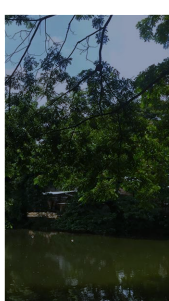
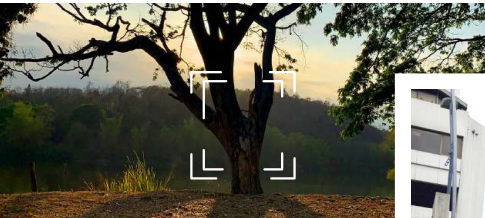
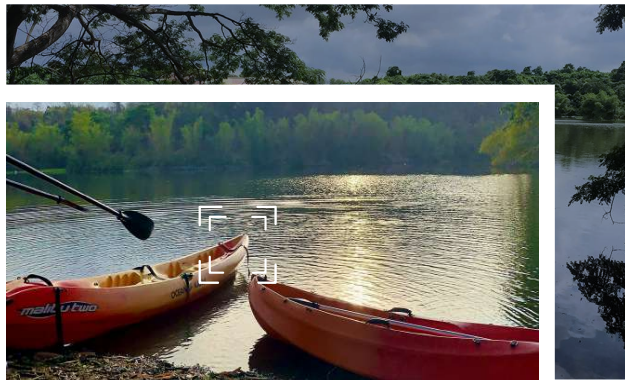


IEEE

# ICPRS 2023

13th International Conference  
on Pattern Recognition Systems

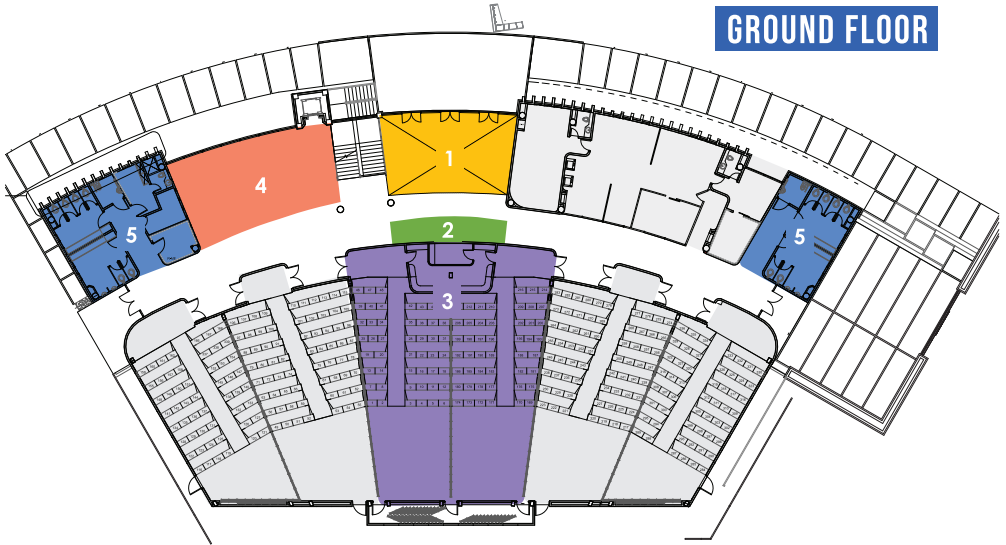
JULY 04 - 07  
GUAYAQUIL, ECUADOR





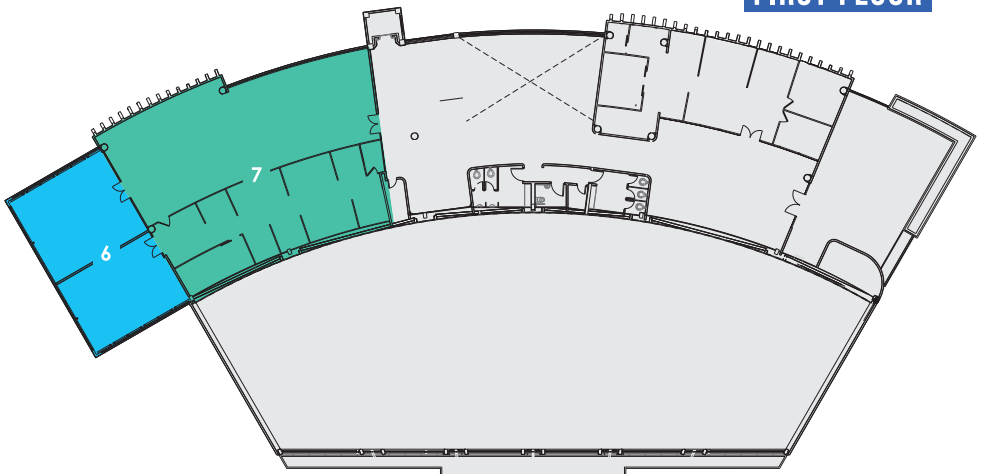
# STEM BUILDING - ESPOL UNIVERSITY

## GROUND FLOOR



- 1 Lobby
- 2 Registration
- 3 Center Hall
- 4 Coffee Break
- 5 Bathrooms

## FIRST FLOOR



- 6 Meeting Room
- 7 Lunch

# INDEX

- 4** Organizers
- 5** Preface
- 6** Conference program
- 7** Keynote speakers
- 13** Program guide: Workshops
- 15** Program guide: Main conference
- 24** Guayaquil practical information

## Organizers Host Institution



### Local Chairs

Prof. Angel Sappa (Computer Vision Center/ESPOL, Spain/Ecuador)

Prof. Boris Vintimilla (ESPOL, Ecuador)

Prof. Monica Karel Huerta (IEEE/Universidad Politécnica Salesiana, Ecuador)

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Darío Carpio Arévalo (ESPOL, Ecuador)

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Dr. Clovis Tauber (UMR U1253 iBrain, Univ. Tours, Inserm, France)

Dr. Maria Trujillo (Universidad del Valle, Colombia)

Prof. Qiao Wang (Southeast University, PR China)

Prof. M. Haroon Yousaf (University of Engineering and Technology Taxila, Pakistan)

# PREFACE

The IEEE 13th International Conference on Pattern Recognition Systems (ICPRS) is an annual event that follows ICPRS-22, ICPRS-21, ICPRS-19, ICPRS-18, ICPRS-17 and ICPRS-16, a continuation of the successful Chilean Conference on Pattern Recognition that reached its 6th edition in 2014. In 2023 it is organised by the Escuela Superior Politécnica del Litoral ESPOL (Guayaquil - Ecuador) and the Chilean Association for Pattern Recognition (ACHiRP, a member of the IAPR), endorsed by the **IAPR (International Association for Pattern Recognition)** and co-sponsored by **IEEE Ecuador Chapter, IEEE CIS Society**.

**The IEEE International Conference on Pattern Recognition Systems (ICPRS-23)** aims to create an important networking forum in which participants can discuss the present and future of pattern recognition systems.

Its predecessors ICPRS-22, ICPRS-21, ICPRS-19, ICPRS-18, ICPRS-17, ICPRS-16, CWPR and CCPR, have traditionally been a meeting point of different disciplines (computer science, engineering, mathematics, etc.) and an opportunity for a wide range of researchers and practitioners to discuss the many different aspects of the application of pattern recognition technologies.

IEEE ICPRS 2023 CONFERENCE PROGRAM			
FIEC LABORATORY		STEM BUILDING	
Tuesday 4th (HYBRID)	<b>Workshop</b> "Preprocessing techniques for clinical images prior to deep learning training" <i>(hands-on workshop)</i> <b>Instructor:</b> Francis Loaiza, Ph. D. (08h00)	<b>Wednesday 5th (HYBRID)</b> Welcome & Opening Session (08h00) <b>Biometric Recognition: Past, Present and Future</b> <b>Prof. Anil K. Jain</b> (08h30) Coffee Break (09h30) <b>Session 1</b> (10h00): Image Processing and Analysis (I)	
		<b>Thursday 6th (HYBRID)</b> <b>Session 5</b> (09h00): Text, Speech and Other PR Applications Coffee Break (09h15) <b>Transformer-based text classification for business analytics and public safety</b> <b>Prof. Sebastián Maldonado &amp; Prof. Carla Vairetti</b> (10h00)	
Friday 7th ONLINE	<b>Workshop</b> "Designing deep learning models for pattern recognition" <i>(hands-on workshop)</i> <b>Instructor:</b> Edwin Valarezo, Ph. D. (13h30)	<b>Session 2</b> (11h20): Pattern Recognition in Medical Applications Break (11h15) Lunch (12h30 - 13h30) <b>Envisioning the Next Generation of Vision and Language Models</b> <b>Prof. Vicente Ordoñez</b> (13h30) Coffee Break (14h30)	
		<b>Session 3</b> (15h00): ML for Biodiversity Data Analysis and Environmental Applications Break (16h15) <b>Session 4</b> (16h20): Pattern Recognition Principles <b>Session 8</b> (16h20): Doctoral Symposium	
Friday 7th ONLINE	<b>Session 9</b> (08h00 <b>ONLINE</b> ): Image Processing and Analysis (II)	<b>Session 6</b> (11h05): Computer Vision Application (I) Lunch (12h20 - 13h30) <b>ML/AI in medicine (detection of speech impairment, language and neurodegeneration)</b> <b>Prof. J. Rafael Orozco</b> (13h30) Coffee Break (14h30)	
		<b>Session 7</b> (15h00): Pattern Recognition Applications Break (16h15) <b>Session 10</b> (10h25 <b>ONLINE</b> ): Computer Vision Application (II)	
<b>Closing Session (11h25, ONLINE)</b>			



## KEYNOTE SPEAKERS

### Distinguished Prof. Anil K. Jain

Biometric Recognition:

Past, Present and Future

Date: 5th July, 08h30



A wide variety of systems require reliable personal recognition schemes to either confirm or determine the identity of an individual requesting their services. The purpose of such schemes is to ensure that the rendered services are accessed **only** by a legitimate user, and not anyone else. Examples of such applications include secure access to buildings, computer networks, mobile phones, healthcare, social benefits, and border crossing. In the absence of robust personal recognition schemes, these systems are vulnerable to the wiles of an impostor. Biometric recognition, or simply biometrics, refers to the automated recognition of individuals based on their anatomical and/or behavioral characteristics (i.e., face, fingerprint, iris and voice). By using biometric traits, it is possible to confirm or establish an individual's identity based on "who she is", rather than by "what she possesses" (e.g., an ID card) or "what she remembers" (e.g., a password). In this talk, I will give a brief overview of the field of biometrics and summarize some of its strengths, limitations including privacy concerns, state-of-the art recognition performance, and future research directions.

Anil K. Jain is a Distinguished Professor in the Department of Computer Science at Michigan State University. Over the past 50 years, his research has focused on pattern recognition, computer vision and biometric recognition. He served as the Editor-in-Chief of the IEEE Trans. Pattern Analysis and Machine Intelligence (PAMI). He is the co-author of Algorithms for Clustering Data (Prentice Hall, 1988), Handbook of Fingerprint Recognition (Springer, 2005, 2009, 2022), Handbook of Multibiometrics (Springer, 2006), Encyclopedia of Biometrics (Springer, 2009, 2015), Introduction to Biometrics (Springer, 2011) and co-editor of Handbook of Face Recognition (Springer). He was a member of the United States Defense Science Board and Forensics Science Standards Board. Jain was awarded Guggenheim, Humboldt and Fulbright fellowships, and was elected to the National Academy of Engineering, The World Academy of Sciences, Chinese Academy of Sciences, and Indian National Academy of Engineering. He was awarded Doctor Honoris Causa by Universidad Autónoma de Madrid, Hong Kong University of Science and Technology and Hong Kong Baptist University.





**Prof. Vicente Ordóñez R.**  
Envisioning the Next Generation of  
Vision and Language Models  
Date: 5th July, 13h30



Training large scale models that learn about the world purely through language has proven impressive in terms of the capabilities that these models can acquire. However, models that are trained with text and images have also produced an impressive set of recent results. I will summarize the extent to which vision-and-language models have the potential to replace some purely visually trained models and some of the evolution and progress of vision-and-language models throughout the years. I will also use the opportunity to discuss some recent works in my group in this area including CLIP-Lite, an effort to investigate how to train CLIP models on limited and scarce data, Attention-Mask-Consistency (AMC), a technique to improve the visual grounding capabilities of vision-and-language models by aligning them with human provided explanations, and SynCLIP which is an effort to improve the compositional reasoning of vision-and-language models through the use of synthetically and procedurally generated data.

Prof. Vicente Ordóñez Román is an Associate Professor in the Department of Computer Science at Rice University where he directs a research group focusing on computer vision, natural language processing and machine learning. He is also an Amazon Visiting Academic at Amazon Alexa AI. His focus is on building efficient visual recognition models that can perform tasks that leverage both images and text. He is a recipient of a Best Paper Award at the conference on Empirical Methods in Natural Language Processing (EMNLP) 2017 and the Best Paper Award -- Marr Prize at the International Conference on Computer Vision (ICCV) 2013. He has also been the recipient of an NSF CAREER Award, an IBM Faculty Award, a Google Faculty Research Award, a Facebook Research Award, and a Google Inclusion Research Award. Previously, he was Assistant Professor in the Department of Computer Science at the University of Virginia. Vicente obtained his PhD in Computer Science at the University of North Carolina at Chapel Hill, an MS at Stony Brook University, and an engineering degree at the Escuela Superior Politécnica del Litoral in Ecuador. In the past, he has also been a visiting researcher at the Allen Institute for Artificial Intelligence and a visiting professor at Adobe Research.





## Prof. Sebastián Maldonado

Transformer-based text classification for business analytics and public safety (*talk given together with Prof. Carla Vairetti*)

Date: 6th July, 10h00



Deep learning (DL) has received increasing attention in the last decade, becoming the de facto solution for several machine learning tasks, including computer vision, signal processing, or text analytics. For the latter application, attention mechanisms based on transformers have significantly improved the performance of DL models on natural language tasks. This gain has opened new possibilities for research in text analytics, creating new opportunities for improving decision-making. In this talk, we first focus on business analytics, automating the analysis of complaints, inquiries, and customer feedback. Providing a prompt answer to customer claims and complaints, as well as analyzing the factors that affect the customer experience the most, are current trends in modern marketing. For the second part of the talk, we present a NLP application for crime analytics. The main goal is to design robust DL classifiers in the presence of noisy labels. We consider data from a crime app, in which users categorize safety reports by choosing one of the various options provided by the app. The users, however, tend to provide incorrect labels either because it is easier for them, e.g. by choosing the first alternative, or by intentionally exaggerating the importance of their reports.

Sebastián Maldonado is currently Full Professor at the Department of Management Control and Information Systems, School of Economics and Business, University of Chile. He received his B.S. and M.S. degrees from the University of Chile, in 2007, and his Ph.D. degree from the University of Chile, in 2011. Sebastián Maldonado has published more than 80 scientific contributions (WOS papers) in the last ten years. He was chair (president) of the Chilean chapter of the IEEE Computational Intelligence Society, and the Chilean chapter of the IFORS' Operational Research Society (ICHIO). He was also a member of the Academic Senate of the University of Chile, and author of the book "Analytics and Big Data: Data science applied to the business world" (ISBN: 978-84-18982-63-7). He is currently Associate Editor of the Information Sciences Journal. His research interests include machine learning, data mining and business analytics.



## Prof. Carla Vairetti

Transformer-based text classification for business analytics and public safety (*talk given together with Prof. Sebastián Maldonado*)

Date: 6th July, 10h00

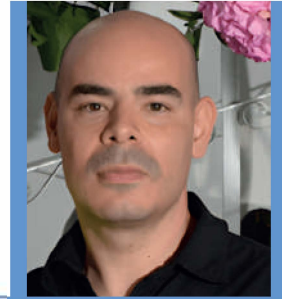


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Carla Vairetti received her B.S. degree in Computer Science in 2000 from the University Nacional de La Plata, Argentina. She also received an M.S. degree in Sciences in 2013 from the Pontificia Universidad Católica, Chile, and the Ph.D. degree in Engineering Sciences in 2016 from the University of Trento, Italy. Currently, she is Associate Professor of Universidad de Los Andes. She is currently chair (president) of the Chilean chapter of the IEEE Computational Intelligence Society, and co-organizer of the Chile-WiC, an annual event that seeks to increase the participation of women in computer-related careers. She is also author of the book "Analytics and Big Data: Data science applied to the business world" (ISBN: 978-84-18982-63-7). Her research interests include classification in imbalanced domains, data science in big data applications, computational intelligence (including machine and deep learning), and data science.



**Prof. J. Rafael Orozco**  
Speech, Language, and Movement  
Processing to Model Parkinson's  
Disease  
Date: 6th July, 13h30



Different movement disorders with different origins produce a wide variety of symptoms. In spite of its high prevalence around the world, diagnosis and monitoring of such disorders are still highly subjective, time-consuming, and expensive. Parkinson's disease (PD) is the second most prevalent movement disorder in the world and medical evaluations used to assess the neurological state of patients cover many different aspects, including activities of daily living, motor aspects, speech, and depression. Automatic evaluation of PD is a challenging task because several bio-signals and modeling methods are required to produce clinically acceptable/practical results. This talk tries to show different approaches that consider several bio-signals (e.g., speech, gait, and handwriting) and methods of Pattern Recognition with the aim to find suitable models for PD diagnosis and monitoring. Results with classical feature extraction and classification methods will be presented together with experiments with CNN and LSTM architectures.

Prof. Juan Rafael Orozco-Arroyave received the B.S. degree in Electronics Engineering from Universidad de Antioquia in 2004, after which he received a postgraduate in Marketing from EAFIT University. In 2011 he was awarded an M.Sc in Telecommunications from Universidad de Antioquia and in 2015 the Ph.D. degree in Electronics Engineering from Universidad de Antioquia (Medellín, Colombia) and in Computer Science from the Friedrich-Alexander-Universität Erlangen-Nürnberg, (Erlangen, Germany). Currently he is a Full Professor at Universidad de Antioquia, leading its GITA Lab and Adjunct Researcher at the Pattern Recognition Lab in the Friedrich-Alexander-Universität Erlangen-Nürnberg. His research interests include Speech Processing, Pattern Recognition, Digital Communications, Digital Signal Processing, and Signals Theory.



## Dr. Enrique V. Carrera

### Radar target detection based on deep learning techniques

Date: 7th July, 09h20



Radar target detection is a process that requires the reception, processing and analysis of radio-frequency signals reflected over long distances. This process must meet several high performance parameters to ensure responsiveness to threats in the environment. Current systems base their operation on algorithms that have poor performance when operating with a low SNR (signal to noise ratio), a situation that is common when analyzing distant targets in uncontrolled environments. However, the improvement in deep learning algorithms has led to supervised training systems that reflect better results when acting as classifiers. Therefore, this talk presents the problem of radar target detection and classical detection algorithms. After that, comparisons between a classical Bayesian algorithm (AR LMS MEAN) and machine/deep learning algorithms are presented. The results discussed in this talk show that deep learning greatly improves radar target detection for low SNR levels. Finally, some future works are reviewed.

Enrique Vinicio Carrera received his bachelor's degree in electronic engineering from the Armed Forces University - ESPE, Ecuador, in 1992, and his master's degree in electrical engineering from the Pontifical Catholic University of Rio de Janeiro, Brazil, in 1996. In 1999, he received his doctoral degree in computer engineering from the Federal University of Rio de Janeiro, Brazil. He was a visiting scholar at the University of Rochester, USA, in 1999. From 2000 to 2004, he was a postdoctoral associate in the Department of Computer Science at Rutgers University, USA. Dr. Carrera was also an associate professor at University San Francisco of Quito, Ecuador, from 2004 to 2011. Since 2011, he has been professor at the Armed Forces University - ESPE, Ecuador. He has also collaborated as an external professor at King Juan Carlos University, Spain, since 2015. Currently, he is an IEEE Senior Member and has an appointment as a Distinguished Visitor at the IEEE Computer Society. Dr. Carrera has participated in approximately 20 research projects, holds more than 100 scientific publications in recognized journals and conferences with more than 3000 citations. His main research areas include signal processing and computational intelligence.



## **WORKSHOP 1 - Preprocessing techniques for clinical images prior to deep learning training.**

**DATE:** 4th July, 08h00

**INSTRUCTOR:** Francis Loaiza, Ph. D.

### **DESCRIPTION**

This is a hands-on workshop which introduces the concepts and techniques for pre-processing tabular data as well as 3D medical images, such as the Magnetic Resonance Images (MRI). This workshop will be the first of a series of two workshops, where participants will be learning by doing the techniques for preparing tabular data and 3D images, before they can be used for training deep learning models. The second workshop will be offered on the 5th of July and will be about designing deep learning models for pattern recognition.

### **OBJECTIVES**

- To understand what 3D medical images are, why they are relevant, and for what purposes.
- To perform an exploratory data analysis on 3D image datasets in common formats, such as DICOM and NIFTI, using free software tools.
- To pre-process data according to the objectives and algorithms' requirements.
- To analyze and understand the results.
- Tools and Libraries.

For this hands-on workshop we will provide access to computers, as well as to standard data science/machine learning tools, such as: Python, NumPy, Jupyter Notebook.

Some specific libraries for medical imaging analysis, such as: PyDicom, NiBabel, ANTs, ITK.

And some interactive tools for visualizing and debugging results, such as: 3D Slicer for viewing and annotating 3D volumes  
MriCron for viewing and overlapping 3D volumes



## **WORKSHOP 2 - Designing deep learning models for pattern recognition.**

**DATE:** 4th July, 13h30

**INSTRUCTOR:** Edwin Valarezo, Ph. D.

### **DESCRIPTION**

The increasing use of deep learning (DL) techniques for solving challenging tasks, such as recognizing and segmenting patterns has raised new disruptive DL architectures. This ICPRS's workshop explores one of the cutting-edge architectures, the Vision Transformers for medical image segmentation. The Vision Transformer (ViT) emerged as a competitive alternative to convolutional neural networks (CNNs) that are currently the state-of-the-art in natural language processing and computer vision, therefore widely used in solving image processing tasks. This workshop will be the second of a series of two hands-on workshops, where participants will be learning by doing the design and implementation of a ViT architecture for both, classification and segmentation tasks using 3D medical imaging datasets, such as Magnetic Resonance Images (MRI).

### **OBJECTIVES**

- To understand the transformer architecture
- To explore the vision transformers architecture for medical image segmentation
- To design and train a model based on vision transformer from scratch, using 3D MRI
- To analyze and understand the results
- Tools and Libraries

We will provide access to computers, as well as to standard data science/machine learning tools, such as:  
Python, NumPy, Jupyter Notebook.

Some specific libraries for deep learning, such as:  
Pytorch



# MAIN CONFERENCE

FIEC Laboratory

CONFERENCE PROGRAM	
GMT - 5	Tuesday, July 4
08h00 - 12h15	<b>Workshop:</b> Preprocessing techniques for clinical images prior to deep learning training <b>Instructor:</b> Francis Loaiza
12h15 - 13h30	Lunch
13h30 - 17h30	<b>Workshop:</b> Designing deep learning models for pattern recognition <b>Instructor:</b> Edwin Valarezo

(O) Online (P) In Person

STEM Building

GMT - 5	Wednesday, July 5	
08h00 – 08h30	Welcome & Opening Session (Best Paper Awards, IEEE ICPRS 2024 Announcement)t	
08h30 – 09h30	<b>Topic 1: Biometric Recognition: Past, Present and Future</b> <b>Prof. Anil K. Jain</b> <i>Department of Computer Science and Engineering at Michigan State University, Michigan</i> Chair: Angel Sappa	
09h30 – 10h00	Coffee Break	
10h00– 11h15	<b>Session 1</b> Image Processing and Analysis (I) Chair: Yann Gavet	
	10h00 (P)	<b>Addressing Bias in Fine-Grained Classification Datasets: A Strategy for Reliable Evaluation</b> Stefan Wolf, Jannik Koch, Lars Sommer, Jürgen Beyerer
	10h15 (P)	<b>Morphological Characterization of Compact Aggregates Using Image Analysis and a Geometrical Stochastic 3D Model</b> Leó Théodon, Carole Coufort-Saudejaud, Ali Hamieh, Johan Debayle
	10h30(P)	<b>Surface Sampling for Optimal Viewpoint Generation</b> Vanessa Staderini, Tobias Glück, Philipp Schneider, Roberto Mecca, Andreas Kugi





(O) Online (P) In Person

STEM Building

GMT - 5	Wednesday, July 5	
	10h45 (O)	<b>Abnormal Scene Classification using Image Captioning Technique: A Landslide Case Study</b> Narongthat Thanyawet, Photchara Ratsamee, Yuki Uranishi, Haruo Takemura
	11h00 (P)	<b>Balanced Pedestrian Attribute Recognition Metrics for Improved Attribute-based Person Retrieval</b> Andreas Specker, Jüergen Beyerer
11h15–11h20	Break	
11h20 – 12h35	<b>Session 2</b> Pattern Recognition in Medical Applications Chair: Cesar Astudillo	
	11h20 (O)	<b>DeepSIT: Deeply Supervised Framework for Image Translation on Breast Cancer Analysis</b> Maria Baldeon-Calisto, Francisco Rivera-Velastegui, Daniel Riofrío, Ricardo Flores Moyano, Noel Pérez, Diego Benítez
	11h35 (P)	<b>Enhancing Schizophrenia Prediction Using Class Balancing and SHAP Explainability Techniques on EEG Data</b> Javiera T. Arias, César A. Astudillo
	11h50 (O)	<b>Melanoma Cancer Classification using Deep Convolutional Neural Networks</b> José M. Cadena, Noel Pérez, Diego Benítez, Felipe Grijalva, Ricardo Flores, Oscar Camacho, Jovani Marrero-Ponce
	12h05 (P)	<b>A Deep Learning-Based Algorithm for ECG Arrhythmia Classification</b> Daniela Espin, Vicente Alvarado, Edwin Valarezo Añazco, Erick Flores, José Santos, Bolívar Nuñez, Sara Guerrero, Jonathan Aviles-Cedeno
	12h20 (O)	<b>Quantifying the Uncertainty in 3D CT Lung Cancer Images Classification</b> Rahimi Zahari, Julie Cox, Boguslaw Obara
12h20 – 13h30	Lunch	



(O) Online (P) In Person

STEM Building

GMT - 5	Wednesday, July 5	
13h30 – 14h30	<b>Topic 2: Envisioning the Next Generation of Vision and Language Models</b> <b>Prof. Vicente Ordóñez Román</b> <i>Department of Computer Science at Rice University, Houston</i> Chair: Enrique Peláez	
14h30 – 15h00	Coffee Break	
15h00 – 16h15	<b>Session 3 ML for Biodiversity Data Analysis and Environmental Applications</b> Chair: Edwin Valarezo	
	15h00 (P)	<b>Spatiotemporal Variations of PM2.5 Concentration and Its Heterogeneous Relationship with Natural and Humanity Factors in Handan of China</b> Qiao Wang, Die Lu, Tanhua Jin, Xiang Zhang, Han Wang, Shifan Han, Yuhui Huang, Jun Cao, Lizhong Gao, Junyan Yang
	15h15 (O)	<b>Climatic Challenges of Quito</b> Llugsi Ricardo
	15h30 (P)	<b>UAV Remote Sensing Applications and Current Trends in Crop Monitoring And Diagnostics: A Systematic Literature Review</b> Pabelco Zambrano, Fernanda Calderon, Miguel Realpe, Jonathan Paillacho, Doménica Pazmiño, Héctor Villegas
	15h45 (O)	<b>Machine Learning and Social Media Harvesting for Wildfire Prevention</b> Arif Dwi Laksito, Kusri Kusri, Arief Setyanto, Muhammad Zuhdi Fikri Johari, Zauvik Rizaldi Maruf, Kumara Ari Yuana, Gardyas Bidari Adninda, Renindya Azizza Kartikakirana, Fitria Nucifera, Wiwi Widayani, Krishna Chandramouli, Ebroul Ezquierdo
	16h00 ( )	<b>Temporal analysis for the identification of extreme rainfall events recorded in Uruguay over a 30-year period (1991-2021)</b> Luana Frias, Nelcy N. Atehortua-Sanchez, Fernando Pasini
16h15 – 16h20	Break	



(O) Online (P) In Person

STEM Building

GMT - 5	Wednesday, July 5	
16h20 – 17h35	<b>Session 4</b> Computer Vision Application (I) Chair: Miguel Realpe	
	16h20 (P)	<b>From Synthetic Data to Real Palm Vein Identification: a Fine-Tuning Approach</b> Ruber Hernández-García, Edwin H. Salazar Jurado, Ricardo J. Barrientos, Francisco Manuel Castro, Julián Ramos, Nicolás Guil
	16h35 (P)	<b>Multi-Channel Gaussian Derivative Neural Networks for Crowd Analysis</b> Hugo Gavilima-Pilatáxi, Julio Ibarra-Fiallo
	16h50 (P)	<b>Candy Classification Using Convolutional Neural Networks, Data Augmentation and Transfer Learning: Application and a New Public Dataset</b> Eduardo-José Villegas-Jaramillo, Mauricio Orozco-Alzate
	17h05 (P)	<b>Beam Recognition for Headlamps Aiming</b> Aymeric Chaumont, Paul Creusy, Agathe Plu, Yasser Almehio, Hafid El Idrissi
	17h20 (P)	<b>Deep Learning-based Human Height Estimation from a Stereo Vision System</b> Henry O. Velesaca, Jorge Vulgarin, Boris Vintimilla



(O) Online (P) In Person

📍 STEM Building

GMT - 5		Thursday, July 6	
08h00 – 09h15		<b>Session 5</b> Text, Speech and Other PR Applications Chair: Sergio Velastin	
		08h00 (O)	<b>Wh-AI-les: Exploring Harmonized Vision Models Robustness Against Distribution Shift</b> Mehdi Mounsif, Mohamed Benabdelkrim, Marie-Anne Bauda, Yassine Motie
		08h15 (O)	<b>Automatic Collection of Transcribed Speech for Low Resources Languages</b> Thales Aguiar, Márjory Da-Costa Abreu
		08h30 (O)	<b>Telugu Spoken Digits Modeling using Convolutional Neural Networks</b> Parabattina Bhagath, A Uma Maheshwara Rao, B Sai Ram, M Anil Kumar Reddy
		08h45 (O)	<b>Application on the Loop of Multimodal Image Fusion: Trends on Deep-Learning Based Approaches</b> Gisel Bastidas-Guacho, Patricio Moreno-Vallejo, Boris Vintimilla, Angel Sappa
		09h00 (O)	<b>Embedding Contextual Information through Reward Shaping in Multi-Agent Learning: A Case Study from Google Football</b> Chaoyi Gu, Varuna De Silva, Coentin Artaud, Rafael Moreira-Pina
09h15 – 10h00		Coffee Break	
10h00 – 11h00		<b>Topic 3: Transformer-Based Text Classification for Business Analytics and Public Safety</b> <b>Prof. Sebastián Maldonado</b> <i>Department of Management Control and Information Systems, School of Economics and Business, University of Chile, Chile</i> <b>Prof. Carla Vairetti</b> <i>Universidad de Los Andes, Chile</i> Chair: Cesar Astudillo	
11h00 – 11h05		Break	



(O) Online (P) In Person

STEM Building

GMT - 5		Thursday, July 6	
11h05 – 12h20		<b>Session 6</b> Pattern Recognition Principles Chair: Vicente Ordoñez	
		11h05 (O)	<b>An Algebraic Approach to the Solutions of the Open Shop Scheduling Problem</b> Agustín Moreno Cañadas, Danna Odette Moreno Mendez, Juan Carlos Riaño Rojas, Juan David Hormaza Pantoja
		11h20 (P)	<b>A Novel Kernel Extension for the Nearest Feature Line Classifier</b> Manuele Bicego, Eduardo-José Villegas-Jaramillo, Mauricio Orozco-Alzate
		11h35 (O)	<b>A Zoom into Ecuadorian Politics: Manifesto Text Classification using NLP</b> Fernanda Barzallo, María Moscoso, Margorie Pérez, María Baldeon-Calisto, Danny Navarrete, Daniel Riofrío, Pablo Medina-Pérez, Susana K. Lai-Yuen
		11h50 (P)	<b>Granulometric Analysis of Maltodextrin Particles Observed by Scanning Electron Microscopy</b> Antoine Bottenmuller, Leó Théodon, Daniel Tobón Velez, Christine Frances, Mallorie Tourbin, Yann Gavet, Johan Debayle
		12h05 (O)	<b>Pre or Post-Softmax Scores in Gradient-based Attribution Methods, What is Best?</b> Miguel Lerma, Mirtha Lucas
12h20 – 13h30		Lunch	
13h30 – 14h30		<b>Topic 4: Speech, Language, and Movement Processing to Model Parkinson's Disease</b> <b>Prof. Juan Rafael Orozco-Arroyave</b> <i>Universidad de Antioquia, Colombia</i> Chair: Boris Vintimilla	
14h30 – 15h00		Coffee Break	



(O) Online (P) In Person

📍 STEM Building

GMT - 5	Thursday, July 6	
<b>15h00 – 16h15</b>	<b>Session 7</b> Pattern Recognition Applications Chair: Sebastián Maldonado	
	<b>15h00 ( )</b>	<b>A Centered Kernel Alignment-Based Strategy for Pest Evolution Tracing: Myopsitta Monachus Case</b> Andrea Viazzi, Avril Maciel, Juan Sebastián Blandón, Julián Gil González
	<b>15h15 (O)</b>	<b>Unsupervised Flight Fault Propagation Analysis Using a Variational Autoencoder</b> Emanuil Mladenov, Miguel Martínez-García, Yu Zhang, Shaheryar Khan, Faizan Patankar
	<b>15h30 (P)</b>	<b>Construction of Spatial Pedigree of Chinese Typical Village Settlements</b> Qiao Wang, Die Lu, Yi Shi, Junyan Yang
	<b>15h45 (O)</b>	<b>ML-Based Vegetative Drought Prediction Employing Satellite Remote Sensing and Precipitation Datasets</b> Jyoti S. Shukla, Rahul Jashvantbhai Pandya
	<b>16h00 (O)</b>	<b>Automatic Subtractive Clustering Algorithm Model (ASCAM) for Blind Identification of QAM Constellations</b> Thanapong Sommart, Vanisara Tuektaewskul, Prapun Suksompong
<b>16h15 – 16h20</b>	Break	
<b>16h20 – 18h00</b>	<b>Session 8</b> Doctoral Symposium Chair: Enrique Pelaez Panel: Vicente Ordoñez, Sebastián Maldonado, Carla Vairetti, Juan Rafael Orozco-Arroyave and Enrique Vinicio Carrera (Online)	
	<b>16h20 (P)</b>	<b>Detecting Multi Thoracic Diseases in Chest X-Ray Images Using Deep Learning Techniques</b> Sebastián Quevedo, Federico Domínguez, Enrique Peláez
	<b>16h45 (P)</b>	<b>Mathematical Palm Vein Modeling for Large-Scale Biometric Recognition</b> Edwin H. Salazar-Jurado, Ruber Hernández-García, Karina Vilches-Ponce, Ricardo J. Barrientos
	<b>17h10 (P)</b>	<b>Study of Machine Learning Techniques for Pedestrian Dynamics Simulation Models</b> Pedro Reyes, Javier Martínez, Juan Bekios-Calfa
	<b>17h35 (P)</b>	<b>Towards Human Intentions Prediction</b> Marjorie Chalén, Ana Tapia-Rosero, Enrique Peláez



**ALL ACTIVITIES WILL BE ONLINE**

**GMT - 5**

**Friday, July 7**

<b>08h00 – 09h15</b> <b>(ONLINE)</b>	<b>Session 9</b> Image Processing and Analysis (II) – <b>ONLINE</b> Chair: Angel Sappa	
	<b>08h00 (O)</b>	<b>gAlt: Deep Learning Based Evaluation of Injurious Running Biomechanics Using 2-Dimensional Pose Estimation</b> Adarsh Iyer
	<b>08h15 (O)</b>	<b>Extending the U-Net Architecture for Strokes Segmentation on CT Scan Images</b> Ivan Guerrón, Noel Pérez, Diego Benítez, Felipe Grijalva, Daniel Riofrío, Maria Baldeon-Calisto
	<b>08h30 (O)</b>	<b>Connected-Components-Based Post-Processing for Retinal Vessels Deep-Learning Segmentation</b> Idris Dulau, Benoit Recur, Catherine Helmer, Cecile Delcourt, Marie Beurton-Aimar
	<b>08h45 (O)</b>	<b>Several Kinds of Residual Neural Networks Driven by Partial Differential Equations and Their Applications in Image Classification and Denoising</b> Haowei Ji, Hao Xu, Yi Zhang, Jinchun He
	<b>09h00 (O)</b>	<b>Red-Unet: An Enhanced U- Net Architecture to Segment Tuberculosis Lesions on X-Ray Images</b> Luis Mosquera-Berrazueta, Noel Pérez, Diego Benítez, Felipe Grijalva, Oscar Camacho, Marco Herrera, Yovani Marrero-Ponce
<b>09h15 – 09h20</b>	Break	
<b>09h20 – 10h20</b> <b>(ONLINE)</b>	<b>Topic 5: Radar Target Detection Based on Deep Learning Techniques</b> <b>Dr. Enrique Vinicio Carrera</b> <i>Universidad de las Fuerzas Armadas - ESPE, Ecuador</i> <b>Chair: Sergio Velastín</b>	
<b>10h20– 10h25</b>	Break	





**ALL ACTIVITIES WILL BE ONLINE**

**GMT - 5**

**Friday, July 7**

**Session 10** Computer Vision Application (II)  
Chair: Boris Vintimilla

**10h25 – 11h25**

**(ONLINE)**

**10h25 (O)**

**In-Depth Benchmarking of Transfer Learning Techniques for Improved Bottle Recognition**

Dominik Bittner, Ricky-Ricardo Hendricks, Luca Horn, Jürgen Mottok

**10h40 (O)**

**Environment Perception by Analyzing the Interactions Between an Autonomous Shuttle and Other Road Users**

Josué Manuel Rivera Velázquez, Pascal Houssam Salmane, Guillaume Saint Pierre, Louahdi Khoudour, Olivier Huynh, Jean-Paul Garrigos

**10h55 (O)**

**Exploring Multi-Food Detection using Deep Learning-Based Algorithms**

Roberto Morales, Juan Quispe, Eduardo Aguilar

**11h10 (O)**

**HO3-SLAM: Human-Object Occlusion Ordering as Add-on for Enhancing Traversability Prediction in Dynamic SLAM**

Jonathan Tay Yu Liang, Tanaka Kanji

**11h25 – 11h35**

**(ONLINE)**

**Closing Session**



## GUAYAQUIL PRACTICAL INFORMATION

Guayaquil has a tropical climate, with hot and humid temperatures throughout the year.

The average temperature ranges between 25 and 30 degrees Celsius.

The rainy season is from December to May, while the dry season is from June to November.

### CITY:

Guayaquil is the largest and most populous city in Ecuador, with a population of over 2.7 million inhabitants.

The city is located on the Pacific coast, at the mouth of the Guayas River, making it one of the most important ports in South America.

Guayaquil is known as the "Pearl of the Pacific" because of its beautiful coastline and sandy beaches.

The city has a rich history, dating back to pre-Columbian times. During the colonial era, Guayaquil was an important commercial center for the Spanish Empire.

Today, Guayaquil is a modern and cosmopolitan city, with many tourist attractions. Some of the most popular places to visit include Malecón 2000, Cerro Santa Ana, Parque Histórico de Guayaquil, and the Anthropological and Contemporary Art Museum.



## GUAYAQUIL PRACTICAL INFORMATION

### GASTRONOMY:

Guayaquil's cuisine is a blend of Spanish and Creole influences.

Some of the most popular dishes include ceviche, rice con bean stew and roast beef, and encebollado.

Encebollado is a traditional Ecuadorian soup made with tuna, yuca, onions, and spices, typically served with popcorn and hot sauce.

The city is also known for its delicious sweets and desserts.

### TRANSPORTATION:

Guayaquil has a wide variety of public transportation options, including buses, taxis, and the articulated bus system.

The articulated bus system is a fast and convenient way to get around the city, with a network of over 12 kilometers.

Taxis are an economical and convenient option, but it is important to make sure the taxi has a meter and the driver turns it on at the beginning of the trip.







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