Karen Yaneth **Sanchez Quiroga**

CURRENT POSITION: POSTDOCTORAL RESEARCHER
AI for Healthcare · Image & Video Processing · Computer Vision
KAUST, Garden G-1355, Thuwal, Saudi Arabia

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Education

Ph.D. in Engineering — *Bucaramanga, Colombia*
Universidad Industrial de Santander UIS — *Aug 2019 - Dec 2023*
Thesis: Deep learning algorithms design for medical imaging in computer-aided diagnosis tasks.

M.Sc. in Electronic Engineering — *Bucaramanga, Colombia*
Universidad Industrial de Santander UIS — *Aug. 2017 - Sep. 2019*
Thesis: A supervised classification system of spectral images acquired with a single-pixel optical architecture and side information.

Energy Engineer — *Bucaramanga, Colombia*
Universidad Autónoma de Bucaramanga UNAB — *Jan. 2012 - Dec. 2016*
Thesis: Technical feasibility study of an urban solid waste incineration system for power generation in the Bucaramanga Metropolitan Area.

Research & Work Experience

King Abdullah University of Science and Technology (KAUST) — *Thuwal, Saudi Arabia*
PostDoctoral Researcher in the Center of Excellence for Generative AI — *April 28, 2024 - current*

- Conducts research at the Image and Video Understanding Lab (IVUL), led by Prof. Bernard Ghanem.
- Leads and contributes to publications in top-tier computer vision and AI conferences.
- Mentors PhD, master's, bachelor's (Kaust Academy), and high school (TKS) students and interns in developing innovative deep learning projects.
- Provides expert guidance and technical support on AI for healthcare and computer vision.

King Fahad Security College — *Riyadh, Saudi Arabia*
Teaching Assistant – KAUST Academy for Ministry of Interior — *Spring 2025 and Fall 2026*

- Teaching assistant for MoI CS223P Applications of Deep Learning Visual Computing (Fall 2026/2027, 43 students).
- Teaching assistant for MoI CS323 Deep Learning for Visual Computing (Spring 2024/2025, 66 students).

Universidad Industrial de Santander — *Bucaramanga, Colombia*
Researcher - MSc/PhD student at the High Dimensional Signal Processing Research Group — *January 2017 - Dec 2023*

- Participated, led and promoted different research projects. Topics included AI-based medical assistance tools, hardware-level privacy preservation, Image/Video Processing, Hyperspectral Imaging, and Compressive Sensing.
- Designed an AI-based computational method for the analysis and screening of chronic ulcers from medical images.
- Led the hospital deployment of an image-processing and deep-learning platform for chronic wound analysis in Santander, training clinical staff on its use in routine wound care.
- Implemented a reconstruction algorithm for seismic data acquired with cross-spread arrays.
- Modeled and simulated a spectral optical system for acquiring compressed measurements.
- Developed a mathematical model for depth estimation in spectral images from compressed measurements using convex programming.

University of Toulouse — *Toulouse, France (Hybrid)*
Researcher - PhD student at the Institut de Recherche en Informatique de Toulouse IRIT — *September 2019 - Dec 2023*

- Conducted research with IRIT professors and Toulouse Hospital radiologists to design domain adaptation and image synthesis algorithms for computer-aided diagnosis tasks as part of the doctoral thesis.

INSA Lyon & Université de Lyon *Lyon, France*

Research Internship - PhD student at the Biomedical Imaging Research Lab CREATIS *Oct 2021 - March 2023*

- Conducted research on the synthetic generation of realistic, clinically useful magnetic resonance images using deep learning.
- Developed a framework for the acquisition and reconstruction of ultrasound images with a single-element transducer.

Institute of Image-Guided Surgery IHU *Strasbourg, France*

Surgical Data Science Summer School *July 2022*

- Trained in hands-on surgical labs and data science lectures on the challenges of image-guided surgery at the Institute of Image-Guided Surgery (IHU), as one of 20 participants selected worldwide and the only one from Latin America.

TéSA Cooperative research laboratory in Telecommunications for Space and Aeronautics *Toulouse, France*

Research Internship - PhD student *November 2021*

- Conducted research with faculty and students to advance the joint project "Fusion of Multitemporal Optical and Synthetic Aperture Radar Images for Anomaly Detection in Citrus Crops."

Universidad de Guanajuato *Salamanca, Mexico*

Summer of Scientific Research - Bachelor student *June 2016 - July 2016*

- Determined the production profile of incinerable waste in Bucaramanga, Colombia, from historical records and evaluated its energy potential as fuel for a thermodynamic cogeneration system, as the recipient of a competitive summer research fellowship.

Ecopetrol *Bucaramanga, Colombia*

Young Researcher - Bachelor student *February 2015 - November 2015*

- Developed research activities for the projection of Colombia's Energy Perspective in 2050, in the areas of nuclear energy and hydrogen. Cooperation Agreement UNAB-UPB-UIS-ICP/ECOPETROL.

Publications

Under Review [3]

2026

Skill-Aligned Annotation for Reliable Evaluation in Text-to-Image Generation

Abdelrahman Eldesokey, Merey Ramazanova, Ahmad Sait, Ansar Khangeldin, **Karen Sanchez**, Tong Zhang, Bernard Ghanem
arXiv preprint arXiv:2605.13223 (2026)

DOI: 10.48550/arXiv.2605.13223

Advancing Video-Text Pretraining with Multi-View Captions

Fida M Thoker, Renaud Vandeghen, **Karen Sanchez**, Marc Van Droogenbroeck, Bernard Ghanem
arXiv preprint arXiv:2609.35090 (2026)

DOI: 10.48550/arXiv.2609.35090

Last Translation Benchmark

Vilém Zouhar, Niyati Bafna, Mukund Choudhary, Maike Züfle, Sara Rajaee, Pinzhen Chen, Jannis Vamvas, and Others
arXiv preprint arXiv:2609.04173 (2026)

DOI: 10.48550/arXiv.2609.04173

Conference Proceedings [21]

2026

LUTSeg: A Longitudinal Multi-Expert Dataset for Ulcer Tissue Segmentation

Karen Sanchez, Carlos Hinojosa, Albert Ávila, Andrea Riano, Diego Romero, Jenny Páez, Martina Llinás, Bernard Ghanem
Medical Image Computing and Computer Assisted Intervention – MICCAI 2026 Workshops and Challenges

DOI: 10.48550/arXiv.2608.25866

B-MIM: Biased Masked Image Modeling for Generalizable Segmentation of Fine-Grained Anatomical Structures

Sebastián González, **Karen Sanchez**, Jose M. Saavedra, Marcelo Pizarro, Bernard Ghanem
Medical Image Computing and Computer Assisted Intervention – MICCAI 2026 Workshops and Challenges

DOI: 10.48550/arXiv.2608.24364

Multimodal Safety Evaluation in Generative Agent Social Simulations

Alhim Vera, Carlos Hinojosa, **Karen Sanchez**, Haidar Bin Hamid, Donghoon Kim, Bernard Ghanem
Proceedings of the 64th Annual Meeting of the Association for Computational Linguistics ACL

DOI: 10.18653/v1/2026.acl-long.1915

SoccerNet 2026 Challenges Results

Anthony Cioppa, Silvio Giancola, Håkan Ardö, Mohamad Dalal, Jan Held, Jérémie Ochin, Jiayuan Rao, **Karen Sanchez**, and Others
18th Asian Conference on Computer Vision ACCV 2026 (2026)

DOI: 10.48550/arXiv.2607.07320

CURE: Curriculum-guided Multi-task Training for Reliable Anatomy Grounded Report Generation

Pablo Messina, Andrés Villa, Juan León Alcázar, **Karen Sanchez**, Carlos Hinojosa, Denis Parra, Álvaro Soto, Bernard Ghanem
Proceedings of the IEEE/CVF Computer Vision and Pattern Recognition Conference CVPR (2026) pp. 36279–36289

DOI: 10.48550/arXiv.2601.15408

2025

WiCV at CVPR 2025: The Women in Computer Vision Workshop

Estefania Talavera, Deblina Bhattacharjee, Himangi Mittal, Mengwei Ren, **Karen Sanchez**, Carla Muntean, JungEun Kim, Mona Jalal
arXiv preprint arXiv:2511.08748 (2025)

DOI: 10.48550/arXiv.2511.08748

2024

SoccerNet 2024 Challenges Results

Anthony Cioppa, Silvio Giancola, Vladimir Somers, Victor Joos, Floriane Magera, Jan Held, and Others
arXiv:2409.10587

DOI: https://doi.org/10.48550/arXiv.2409.10587

CO2Wounds-V2: Extended Chronic Wounds Dataset From Leprosy Patients

Karen Sanchez, Carlos Hinojosa, Olinto Mieles, Chen Zhao, Bernard Ghanem, Henry Arguello
2024 IEEE International Conference on Image Processing (ICIP 2024)

DOI: 10.1109/ICIP51287.2024.10647641

2023

Mask-Guided Data Augmentation for Multiparametric MRI Generation with a Rare Hepatocellular Carcinoma

Karen Sanchez, Carlos Hinojosa, Kevin Arias, Henry Arguello, Denis Kouamé, Olivier Meyrignac, Adrian Basarab
2023 IEEE 20th International Symposium on Biomedical Imaging (ISBI)

DOI: 10.1109/ISBI53787.2023.10230758

2022

Hierarchical Compressed Subspace Clustering Of Infrared Single-Pixel Measurements

Miguel Marquez, Jonathan Monsalve, Kevin Arias, **Karen Sanchez**, Carlos Hinojosa, Henry Arguello
2022 12th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS)

Cocosvi: Single Snapshot Compressive Spectral Video Via Covariance Matrix Estimation

Jonathan Monsalve, Miguel Marquez, **Karen Sanchez**, Carlos Hinojosa, Iñaki Esnaola, Henry Arguello
2022 12th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS)

2021

Two-step deep learning framework for chronic wounds detection and segmentation: A case study in Colombia

Brayan Monroy, Jorge Bacca, **Karen Sanchez**, Henry Arguello, Sergio Castillo
2021 XXIII Symposium on Image, Signal Processing and Artificial Vision (STSIVA)

Subspace-based Domain Adaptation Using Similarity Constraints for Pneumonia Diagnosis within a Small Chest X-ray Image Dataset

Karen Sanchez, Carlos Hinojosa, Henry Arguello, Simon Freiss, Nicolas Sans, Denis Kouamé, Olivier Meyrignac, Adrian Basarab
2021 IEEE 18th International Symposium on Biomedical Imaging (ISBI)

DOI: 10.1109/ISBI48211.2021.9434173

Compressed-domain Classification Algorithm for Spectral Imaging Based on Designed Single-Pixel Camera Codification
Karen Sanchez, Carlos Hinojosa, Hans Garcia, Henry Arguello, Sergio Castillo
OSA Imaging and Applied Optics Congress 2021 (3D, COSI, DH, ISA, pcAOP)
DOI: 10.1364/COSI.2021.CTu2F.5

2020

Accurate Deep Learning-based Gastrointestinal Disease Classification via Transfer Learning Strategy
Jessica Escobar, **Karen Sanchez**, Carlos Hinojosa, Henry Arguello, Sergio Castillo
2021 XXIII Symposium on Image, Signal Processing and Artificial Vision (STSIVA)
DOI: 10.1109/STSIVA53688.2021.9591995

Transfer learning with convolutional neural network for gastrointestinal diseases detection using endoscopic images
Jessica Paola Escobar, Natalia Gomez, **Karen Sanchez**, Henry Arguello
2020 IEEE Colombian Conference on Applications of Computational Intelligence (IEEE ColCACI 2020)

2019

Sparse subspace clustering for hyperspectral images with missing pixels
Jorge Bacca, **Karen Sanchez**, Henry Arguello
2019 XXII Symposium on Image, Signal Processing and Artificial Vision (STSIVA)

Non-destructive method for classification of cocoa beans from spectral information
Natalia Andrea Gomez, **Karen Sanchez**, Henry Arguello
2019 XXII Symposium on Image, Signal Processing and Artificial Vision (STSIVA)

2018

Multi-resolution coded apertures based on side information for single pixel spectral reconstruction
Hans Garcia, Claudia V Correa, **Karen Sánchez**, Edwin Vargas, Henry Arguello
2018 26th European Signal Processing Conference (EUSIPCO)
DOI: 10.23919/EUSIPCO.2018.8553602

Determination of the production profile of incinerable waste for the city of Bucaramanga and its energy capacity
Miguel Gómez-Martínez, **Karen Sanchez**, Carlos Diaz, Gutierrez-Martinez, and Others
2018 XXXI International Summer Meeting on Power and Industrial Applications

Supervised Classification of Hyperspectral Images using Side Information
Karen Sanchez, Carlos Hinojosa, Henry Arguello
Imaging and Applied Optics 2018 (3D, AO, AIO, COSI, DH, IS, LACSEA, LS&C, MATH, pcAOP)
DOI: 10.1364/3D.2018.JW5E.5

Published Journal Papers [7]

2024

Learning to Describe Scenes via Privacy-Aware Designed Optical Lens
Paula Arguello, Jhon Lopez, **Karen Sanchez**, Carlos Hinojosa, Fernando Rojas-Morales, Henry Arguello
IEEE Transactions on Computational Imaging 10 (2024) pp. 1069–1079. IEEE
DOI: 10.1109/TCI.2024.3426975

2023

Automated chronic wounds medical assessment and tracking framework based on deep learning
Brayan Monroy*, **Karen Sanchez***, Paula Arguello, Juan Estupiñán, Jorge Bacca, Claudia V Correa, Laura Valencia, Juan C Castillo, Olinto Mieles, Henry. Arguello, *Equal contributors
Computers in Biology and Medicine 165 (2023) p. 107335. Elsevier
DOI: 10.1016/j.compbiomed.2023.107335

2022

C-3SPCD: coded aperture similarity constrained design forspatio-spectral classification of single-pixel measurements
Carlos Hinojosa, **Karen Sanchez**, Hans Garcia, Henry Arguello
Appl. Opt. 61.8 (2022) E21–E32. Optica Publishing Group
DOI: 10.1364/AO.445326

CX-DaGAN: Domain Adaptation for Pneumonia Diagnosis on a Small Chest X-ray Dataset
Karen Sanchez, Carlos Hinojosa, Henry Arguello, Denis Kouamé, Olivier Meyrignac, Adrian Basarab
IEEE Transactions on Medical Imaging (2022). IEEE
DOI: 10.1109/TMI.2022.3182168

2021

BILSK: A bilinear convolutional neural network approach for skin lesion classification
Camilo Calderón*, **Karen Sanchez***, Sergio Castillo, Henry Arguello, *Equal contributors
Computer Methods and Programs in Biomedicine Update 1 (2021) p. 100036. Elsevier
DOI: 10.1016/j.cmpbup.2021.100036

Classification of cocoa beans based on their level of fermentation using spectral information
Karen Sanchez, Jorge Bacca, Laura Arévalo-Sánchez, Henry Arguello, Sergio Castillo
TecnoLógicas 24.50 (2021) pp. 172–188. Instituto Tecnológico Metropolitano-ITM
DOI: 10.22430/22565337.1654

2019

Supervised spatio-spectral classification of fused images using superpixels
Karen Sanchez, Carlos Hinojosa, Henry Arguello
Appl. Opt. 58.7 (2019) B9–B18. OSA
DOI: 10.1364/AO.58.0000B9

Chapter of Book [1]

Leonardo Pacheco et.al. *Prospectiva energética Colombia 2050*. Ed. by Ediciones UIS. 2019. ISBN: 9789588956503.

Professional Services

Leadership roles

General Chair, *Women in Computer Vision (WiCV)* Workshop at CVPR 2026, Denver, CO, USA.
Co-organizer, *KAUST Rising Stars in AI Symposium 2026*, King Abdullah University of Science and Technology (KAUST), KSA.
Lead Communication Manager, *SoccerNet* Datasets and Challenges 2026.
Co-Chair, *Women in Computer Vision (WiCV)* Workshop at CVPR 2025, Nashville, TN, USA.
Co-organizer, *KAUST Rising Stars in AI Symposium 2025*, King Abdullah University of Science and Technology (KAUST), KSA.
Lead Communication Manager, SoccerNet Datasets and Challenges 2025.
Public Relations and Outreach Chair, *LatinX in Computer Vision (LXCV)* Workshop at CVPR 2025, Nashville, TN, USA.
Outreach Chair, *LatinX in Computer Vision (LXCV)* Workshop at CVPR 2023, Vancouver, Canada.
Publicity Chair, *LatinX in Computer Vision (LXCV)* Workshop at ICCV 2023, Paris, France.
Public Relations and Outreach Chair, *LatinX in Computer Vision (LXCV)* Workshop at CVPR 2022, New Orleans, USA.
Publicity Chair, *STSIVA 2019* XXII Symposium on Image, Signal Processing and Artificial Vision, Bucaramanga, Colombia.

Examination committee membership

M.Sc. Thesis – Universidad Industrial de Santander, Colombia

2026 **Maria Angelica Bravo**, Development of a Machine Learning Algorithm for Mortality Prediction in Pediatric Patients Hospitalized in Intensive Care Units. *Laureate Thesis Award.*

2024 **Alejandro Navarro**, Feasibility to Use Clustering Methods to Improve Contrastive Learning Methods for the Detection of Atrial Fibrillation.

Advising and Mentorship

B.Sc. Thesis - Universidad Industrial de Santander, Colombia

2024 **Paula Andrea Arguello**, Lens design for image captioning while preserving privacy. *Co-advisor. Laureate Thesis Award.*

2023 **Juan Sebastian Estupiñan**, Computational tool for assisting in treating chronic wounds in Hansen patients from the Department of Santander. *Laureate Thesis Award.*

2020 **Natalia Gomez Albiadez**, Detection of pneumonia in X-ray images from image processing and neural networks.

Reviewer

Reviewer for *IEEE Transactions on Medical Imaging (TMI), IEEE International Symposium on Biomedical Imaging (ISBI), IEEE International Conference on Image Processing (ICIP), Applied Optics, MICCAI, among others.*,

Invited Talks and Panels

Semana de la Ingeniería 2026 (Engineering Week 2026). Invited as a speaker by the Universidad Autónoma de Bucaramanga (UNAB), Bucaramanga, Colombia. Talk: AI in Healthcare: Challenges and Perspectives. October 29, 2026.
10 Congreso de Ingeniería de Sistemas (10th Systems Engineering Congress). Invited speaker by the Universidad de Investigación y Desarrollo (UDI), Colombia. Talk: AI in Healthcare: Challenges and Perspectives in Latin America. October 28, 2026.
Semana de la Innovación y Sostenibilidad (Innovation and Sustainability Week), Prospects for the Future. Invited as a Keynote speaker by the Fundación Santa Fe de Bogotá hospital, Colombia. Talk: AI in Healthcare. April 29, 2025. Virtual talk.
Top Current Status of the AI/CV Ecosystem in Latin America. Invited panelist for the LXAI workshop at ECCV 2024, Milan.
Latam Undergraduate Research Program. Invited by Google Explore CSR. Talk: AI in healthcare, closing gaps in LATAM. March 23, 2024. Virtual talk.
I Seminar on Medical Image Processing SEMIP 2022. Invited by the Universidad Industrial de Santander. Talk: Domain adaptation based on subspace projection and GANs for pneumonia diagnosis in a small X-ray dataset. April 20, 2022. Bucaramanga.
Congreso Internacional de Ingeniería Biomédica BioCon 2021 (I International Congress of Biomedical Engineering) Invited by IEEE PERU Section. Talk: Medical imaging from the AI perspective. December 18, 2021. Lima, Peru.
Women in Data Science WiDS Medellin 2021 Invited by DataScienceFem. Talk: Artificial intelligence and medical images: Challenges and perspectives. 25.09.2021. Medellin, Colombia.

Media News

- "Personaje de la Semana" ("Character of the Week"), at Caracol Radio.
- "Gente de Ciencia" ("People of Science"), at Radio UIS.
- Newspaper article "UIS obtuvo tercer lugar en concurso mundial de inteligencia artificial al servicio de tumores raros" ("UIS obtained third place in the global competition for AI in the service of rare tumors"), at Vanguardia Liberal.
- Newspaper article "Ingeniera se destaca en concurso Bayer Young Community Innovators" ("Engineer stands out in the Bayer Young Community Innovators competition"), at Vanguardia Liberal.
- Audiovisual reports "Lepra: una historia que deja 'llaga' en Santander" ("Leprosy: A story that leaves a 'sore' in Santander") and "Tecnología para el tratamiento de pacientes de Hansen" ("Technology for the treatment of Hansen's patients"), at UIS.

Honors & Awards

2023	**Laureate Doctoral Thesis**, Doctoral thesis awarded with laureate distinction by Universidad Industrial de Santander (UIS).	*Colombia*
2022	**SFR 2021 Artificial Intelligence Data Challenge, 3rd Place Winner**, "Data augmentation in AI at the service of rare tumors" challenge competition from the Société Française de Radiologie. Team composed of members of the HDSP, CREATIS, and IRIT labs, and the Hôpitaux de Paris.	*France*
2022	**Surgical Data Science Summer School**, Qualification and Grant for the 1st Surgical Data Science Summer School at the Institute of Image Guided Surgery (IHU), led by the University of Strasbourg and the research group CAMMA Computational Analysis and Modeling of Medical Activities	*France*
2017	**Bayer Young Community Innovators, 2nd Place Winner**, National prize led by Bayer S.A. Award-winning project: Spectroscopy, the new era of cocoa.	*Colombia*
2017	**National scholarship for Master's studies**, Call for the "Formation of high-level human capital for the department of Santander," awarded by: MinCiencias	*Colombia*
2017	**Medal of special recognition for Merit in research**, By the Secretariat of Information Technology and Communications - Government of Santander.	*Colombia*
2016	**Academic Excellence in Research**, Awarded by the Universidad Autónoma de Bucaramanga.	*Colombia*
2016	**National Prize for Energy Efficiency, 1st Place Winner**, For the Colombia Energy Prospective 2050 project, team joint UNAB members. Awarded by MinMinas, UPME, Findeter, and Andesco.	*Colombia*
2016	**Summer of Scientific Research**, Scholarship for the Scientific Summer at the University of Guanajuato from the Mexican government for international students.	*Mexico*