Curriculum Vitae

Dr Boris X. Vintimilla Burgos

PERSONAL INFORMATION:

<u>Contact Address:</u>

Faculty of Electrical and Computer Engineering (FIEC)
Center for Research, Develop. and Innovation of Computational Systems (CIDIS)
Escuela Superior Politécnica del Litoral (ESPOL)
Campus Gustavo Galindo, Prosperina, Km. 30.5 vía Perimetral
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Date of Birth:
  08 August 1972

Nationality:
  Ecuadorian – Italian

Languages:
  Spanish, English and Catalan

Research experience:

EDUCATIONAL BACKGROUND:

1995 - 2001	**Ph.D.**, Industrial Engineer, Doctoral Programme in: Advanced Automation and Robotics, Institute of Industrial and Control Engineering, Polytechnic University of Catalonia, Barcelona, Spain. Level: Honours Cum Laude.
1998	**Engineer**, Industrial Engineer, Spanish Ministry of Education and Culture, Madrid, Spain.
1991 - 1995	**Engineer**, Mechanical Engineer, Faculty of Mechanical Engineering, Escuela Superior Politécnica del Litoral (ESPOL), Guayaquil, Ecuador.

VISITING RESEARCHER:

2008 – 2009	**Post–Doc Researcher**, Digital Imaging Research Centre, Kingston University, London, UK.
Mar. – Apr. 2006	**Visiting Researcher** in the Computer Vision Centre (CVC) at Autonomous University of Barcelona, Barcelona, Spain.
Mar. – Apr. 2023	**Visiting Researcher** in the Computer Vision Centre (CVC) at Autonomous University of Barcelona, Barcelona, Spain.
Mar. – May. 2024	**Visiting Researcher** at Cardiff University, Wales, UK.

EMPLOYMENT INFORMATION:

Dic. 2017 – present	Full Professor – level 3, Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.
Nov. 2014 – Nov. 2017	Full Professor – level 1, Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.

May 2008 – Oct. 2014	Professor, Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.
May 2004 – Ap. 2008	Associate Professor (similar), Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.
May 2001 – Ap. 2004	Assistant Professor (similar), Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.
Oct. 1995 – Jan. 2001	Doctoral Research, Polytechnic University of Catalonia, Barcelona, Spain.
Mar. – May 1994	Teaching Assistant, Mathematics Institute, ESPOL University, Ecuador.

MAIN RESEARCH AREAS:

- External Quality Inspection of Post-harvest Fruits using Computational Intelligent Methods.
- Detection, Tracking and Analysis of Human Body Motion from Video Sequences.
- Processing and Analysis of Multispectral Images.
- Image Representation through Adaptive Triangular Meshes (Geometric Representations).
- Image Geometric Processing with Triangular Meshes.
- Vision Applied to Mobile Robotics.

COURSES AND LECTURES:

Sept. 2015 – present	- Computer Vision (postgraduate, Doctoral and Master Program in Computer Science, ESPOL) - Theories and Applications of Computer Vision (postgraduate, Doctoral and Master Program in Computer Science, ESPOL)
2016 – 2021	- Capstone course (undergraduate)
2009 – present	- Digital Image Processing (undergraduate)
2009 – 2010	- Seminary: Topic in Computer Vision and Image Analysis.
2004 – Sept. 2008	- Digital Image Processing - Computer Vision
2003 – 2004	- Programming Fundamentals - Seminary: Special topics on Computer Vision
2002 – 2003	- Seminary: Special topics on Digital Image Processing - Topic II : Digital Image Processing – part II - Topic II : Computer Vision – part II
2001 – 2002	- Signals and Systems - Topic I : Digital Image Processing – part I - Topic I : Computer Vision – part I
Mar. – May 1994	- Mathematics

SUPERVISED THESES:

DOCTORAL THESIS

- G. Bastidas, **PhD (continue)**. "Deep learning-based architectures for multimodal image fusion". ESPOL University, Ecuador.
- L. Chuquimarca, **PhD (continue)**. "External Quality Inspection of Post-harvest Fruits using Computational Intelligent Methods". ESPOL University, Ecuador
- J. Charco, **PhD (2023)**. "3D Human Pose Estimation based in Deep Learning Techniques from Multi-view Environments". Co-supervisor. ESPOL University, Ecuador.
- R. Rivadeneira, **PhD (2023)**. "Far infrared spectrum image enhancement using deep convolutional networks". Co-supervisor. ESPOL University, Ecuador.
- P. Suarez, **PhD (2020)**. "Processing and representation of multispectral images using deep learning techniques". Co-supervisor. ESPOL University, Ecuador.
- M. Realpe, **PhD (2016)**. "Fault tolerant perception for urban autonomous vehicles". Co-supervisor. Griffith University, Australia.
- D. Ochoa, **PhD (2011)**. "Biological image analysis on model organisms". Co-supervisor. Ghent University, Belgium.

MASTER THESIS

- E. Moran, **MSc (2024)**. "Automatic supermarket shelf audit using deep learning and computer vision techniques". ESPOL University, Ecuador.
- S. Rosero, **MSc (2019)**. "Face recognition: An analysis of traditional techniques and deep learning techniques". ESPOL University, Ecuador

FINAL UNDERGRADUATE PROJECTS

- **From 2015 to the present**, I have supervised 2 undergraduate final projects each year in various topics in the areas of computer vision and machine learning.
- J. Rubio, **B.S. (2015)**. "Hand motion assessment and analysis in a Parkinson's patient based on UPDRS scale by using computer vision techniques with Kinect". ESPOL University, Ecuador
- L. León and C. López, **B.S. (2015)**. "Motion analysis of head and shoulders as diagnostic support in the treatment of cervical trauma using computer vision techniques". ESPOL University, Ecuador.
- Ma. Velarde, E. Perugachi, **B.S. (2014)**. "Tracking and Analysis of the Movement of Upper Limbs Applied to Physical Rehabilitation of a Patient Using Artificial Vision Techniques". ESPOL University, Ecuador.
- J. Rivera De La Cruz and A. Buri H., **B.S. (2012)**. "Segmentation of license plate images using region growing methods". ESPOL University, Ecuador.
- G. Bermúdez and R. Mateo, **B.S. (2011)**. "Data Collection, visualization and analysis for a parking management system". ESPOL University, Ecuador.
- C. Choez and S. Salas, **B.S. (2011)**. "Geometric correction of images". ESPOL University, Ecuador.
- H. Rodríguez and R. Vera, **B.S. (2011)**. "License plates detection and extraction from video signals". ESPOL University, Ecuador.
- J. Faytong and G. Moggia, **B.S. (2009)**. "Road Monitoring Automatic System Using Detection, Tracking, and Features Extraction of Vehicles with Computer Vision Techniques". ESPOL University, Ecuador.
- D. Romero, **B.S. (2007)**. "Technological System for Remote Interaction and Monitoring in Medical Applications: MediRobot". ESPOL University, Ecuador.
- L. Atiencia, J. Chicala and R. Jacho, **B.S. (2006)**. "Tracking and Recognition of Mobile Objects in a Robot Soccer System". ESPOL University, Ecuador.
- M. Realpe, **B.S. (2006)**. "Towards the Autonomous Navigation of Robots through the Implementation of a SLAM Method (Simultaneous Localization And Mapping) with Vision 3D". ESPOL University, Ecuador.
- D. Paillacho and V. Salamea, **B.S. (2003)**. "Design and Implementation of an Autonomous Robots Soccer Team Working in Real-Time: Electro-Mechanic Component". ESPOL University, Ecuador.
- C. Villarroel, C. Calderón and R. Carrillo, **B.S. (2003)**. "Design and Implementation of an Autonomous Robots Soccer Team Working in Real-Time: Intelligent Component". ESPOL University, Ecuador.

COMMITTEE AND EXAMINATION - DOCTORAL THESIS:

COMMITTEE - DOCTORAL THESIS

- J. Charco, **PhD (2023)**. "*3D Human Pose Estimation based in Deep Learning Techniques from Multi-view Environments*". ESPOL University, Ecuador (2023).
- R. Rivadeneira, **PhD (2023)**. "*Far infrared spectrum image enhancement using deep convolutional networks*". ESPOL University, Ecuador (2023).
- P. Suarez, **PhD (2020).** "*Processing and representation of multispectral images using deep learning techniques*". ESPOL University, Ecuador (2020).
- D. Romero L., **PhD (2014).** "*Identificação e Seguimento de Movimentos Não-Padrão de Pessoas para Inferência Automática de Atividades Humanas usando Visão Computacional*". Universidad Federal Espíritu Santo (UFES), Brasil (2014).
- D. Ochoa, **PhD (2011).** "*Biological lmage Analysls on Model Organisms*". Ghent University, Belgium (2011).

EXAMINATION - DOCTORAL THESIS

- D. Romero L., **PhD candidate (2013)**. "*Identificação e Seguimento de Movimentos Não-Padrão de Pessoas para Inferência Automática de Atividades Humanas usando Visão Computacional*". Universidad Federal Espíritu Santo (UFES), Brasil (2013).
- D. Ochoa, **PhD (2011).** "*Biological lmage Analysls on Model Organisms*". Ghent University, Belgium (2011).

EDITORIAL SERVICE:

- **Editor-in-Chief**, "Revista Tecnológica" (2005, 2006, 2007). ISSN: 0257-1749 (print edition) and ISSN: 1390-3659 (online edition: www.rte.espol.edu.ec). Indexed in Latindex.

SCHOLARSHIPS AND SUPPORTS:

Mar. – May. 2024	Partial scholarship as **Visiting Researcher** at Cardiff University, Wales, UK; funded by ESPOL University, Ecuador.
Mar. – Apr. 2023	Partial scholarship as **Visiting Researcher** in the Computer Vision Centre (CVC) at Autonomous University of Barcelona, Barcelona, Spain; funded by ESPOL University, Ecuador.
Apr. 2021	**Award** for International Research Collaboration, Cuartiles 2020 Mayores by ESPOL University, Ecuador.
Apr. 2021	**Award** for Innovative Research, Cuartiles 2020 Mayores by ESPOL University, Ecuador.
2008 – 2009	Scholarship to support my **Post-PhD** in the Digital Imaging Research Centre at Kingston University, London–UK; funded by ESPOL University, Ecuador.
Mar. – Apr. 2006	Partial scholarship as **Visiting Researcher** in the Computer Vision Centre at Autonomous University of Barcelona, Barcelona–Spain; funded by ESPOL University, Ecuador.
1998 – 2000	Partial scholarship to support the **Writing** of my **Doctoral Thesis** in the Institute of Industrial and Control Engineering, Polytechnic University of Catalonia, Barcelona–Spain; funded by Foundation for Science and Technology (FUNDACYT), Ecuador.
1996 – 2000	MUTIS Scholarship as **PhD Student** in the Institute of Industrial and Control Engineering, Polytechnic university of Catalonia, Barcelona–Spain; funded by Spanish Agency for International Cooperation (AECI), Spain.
Mayo 1995	**Scholarship to visit** universities and industries in Germany; funded by Deutscher Akademischer Auftaufdients (DAAD), Germany.

1992 – 1994	**Support** for getting **Books** during my Engineering studies, funded by ESPOL University, Ecuador.

Research results:

MAJOR FUNDED RESEARCH PROJECTS:		
PERIOD	**PROJECT TITLE / FINANCING**	**POSITION**
May. 2022 – May. 2024	Guided thermal image super-resolution	Researcher.
Feb. 2021 – Jun. 2021	Estimación de diámetro usando imágenes 3D	Researcher.
Dec. 2020 – Apr. 2021	Detección de cinta indicadora de semana de maduración y reconocimiento de color usando visión artificial	Researcher.
Jan. 2018 – Dec. 2021	"Ibero-American thematic network on ICT applications for smart cities", funded by CYTED, España.	Researcher.
Aug. 2014 – Sep. 2017	"Integrated system for emergency management using sensor networks and reactive signaling" (Kishwar), funded by ESPOL, Ecuador. Code: G4-DI-2014.	Project Lead, from Nov. 2015.
Aug. 2015 – Jul. 2017	"Pattern recognition: case study on agriculture and aquaculture", funded by ESPOL, Ecuador. Code: M1-DI-2015	Researcher.
Feb. 2015 – Feb. 2016	**Prometeo Program–Parte II:** "Computer Vision: (i) teaching at undergraduate and graduate; (ii) basic and applied research in multispectral vision systems", funded by SENESCYT, Ecuador.	Promoter.
Jul. 2013 – Sep. 2013 **Dic. 2013 – Feb. 2014**	**Prometeo Program–Parte I:** "Computer Vision: (i) teaching at undergraduate and graduate; (ii) basic and applied research in multispectral vision systems", funded by SENESCYT, Ecuador.	Promoter.
Oct. 2008 – Oct. 2009	**Post-Doc:** *"Human behaviour analysis from videos sequences"*, in Digital Imaging Research Centre at Kingston University - UK, funded by ESPOL, Ecuador.	Post-Doc.
Apr. 2003 – Mar. 2009	*"Component 8: Education and research capabilities development programme for: computer science, robotics, and telecommunications"*, funded by Vlaamse Interuniversitaire Raad (VLIR) and ESPOL University, Ecuador and Belgium.	Co-Promoter: "Vision and Robotics" Sub-Component.
Sept. 2007 – Oct. 2008	*"PRESO 1,0 A Police robot equipped for special operations: Teleoperation and motion control"*, funded by ESPOL University (Ref. PEC-07-16), Ecuador.	Project Lead
Nov. 2002 – Oct.2003	*"3D Reconstruction for solid objects from multiple range images"*, funded by Foundation for Science and Technology (FUNDACYT, Ref. PFN-. 170), Ecuador.	Project Lead
Aug. 2001 – Dec. 2005	*" Robotics Iberoamerican Network (RIBERO)"*, funded by Latin-American Science & Technology Development Programme (CYTED), Spain.	Researcher.
Aug. 2001 – Dec. 2005	*" Assisted Programming of Robots for Industrial Tasks (PARTI)"*, funded by Latin-American Science & Technology Development Programme (CYTED), Spain.	Researcher (vision module).
Jan. – Dec. 2002	*" Design and implementation of an autonomous robots soccer team working in real-time"*, funded by ESPOL University, Ecuador.	Project Co-Lead
Jan. – Dec. 2002	*"3D Camera for acquiring range images"*, by ESPOL University, Ecuador.	Project Lead

PUBLICATIONS (1): book chapters, refereed journals and conference papers

[1] "Towards a Robust Solution for the Supermarket Shelf Audit Problem: Obsolete Price Tags in Shelves" Written with: Emmanuel Moran Barreiro. 26th Iberoamerican Congress on Pattern Recognition. Coimbra, Portugal. November, 2023

[2] "Deep Learning-based Human Height Estimation from a Stereo Vision System" Written with: Jorge Vulgarin and Henry Velesaca. 2023 IEEE 13th International Conference on Pattern Recognition Systems, ICPRS 2023. Guayaquil, Ecuador. July, 2023

[3] "Application on the Loop of Multimodal Image Fusion: Trends on DeepLearning Based Approaches" Written with: Gisel Bastidas-Guacho, Patricio Moreno-Vallejo and Angel D. Sappa. 2023 IEEE 13th International Conference on Pattern Recognition Systems, ICPRS 2023. Guayaquil, Ecuador. July, 2023

[4] "Thermal Image SuperResolution Challenge Results - PBVS 2023" Written with: Rafael E. Rivadeneira, Angel D. Sappa, Chenyang Wang, Junjun Jiang, Xianming Liu, Zhiwei Zhong, Dai Bin, Li Ruodi and Li Shengye. IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops. Vancouver, Canada. June, 2023

[5] "Towards a Robust Solution for the Supermarket Shelf Audit Problem" Written with: Emmanuel Moran and Miguel Realpe. 18th International Conference on Computer Vision Theory and Applications VISAPP 2023. Lisbon, Portugal. February, 2023.

[6] "Fruit defect detection using CNN models with real and virtual data". Written with: Luis Chuquimarca, Renzo Pacheco, Paula Gonzalez, and Sergio Velastin. 18th International Conference on Computer Vision Theory and Applications VISAPP 2023. Lisbon, Portugal. February, 2023

[7] "Banana Ripeness Level Classification using a Simple CNN Model Trained with Real and Synthetic Datasets". Written with: Luis Chuquimarca and Sergio Velastin. 18th International Conference on Computer Vision Theory and Applications VISAPP 2023. Lisbon, Portugal. February, 2023

[8] "Human Body Pose Estimation in Multiview Environments". Written with: Jorge L. Charco, Angel D. and Henry O. Velesaca. Intelligent Systems Reference Library (ICT Applications for Smart Cities Part of the Intelligent Systems Reference Library book series. 2022

[9] "Thermal Image SuperResolution: A Novel Unsupervised Approach". Written with: Rivadeneira, Rafael E. and Sappa, Angel D. Communications in Computer and Information Science 15th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications. 2022

[10] "Thermal Image SuperResolution Challenge Results- PBVS 2022". Written with: Rafael E. Rivadeneira, Angel D. Sappa, Jin Kim and Dogun Kim et al. IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW 2022). New Orleans, Louisiana. June, 2022

[11] "Multi-Image Super-Resolution for Thermal Images". Written with: Rafael E. Rivadeneira and Angel D. Sappa. 17th International Conference on Computer Vision Theory and Applications (VISAPP 2022) February, 2022

[12] "Human Pose Estimation through A Novel Multi-View Scheme". Written with: Jorge L. Charco and Angel D. Sappa. 17th International Conference on Computer Vision Theory and Applications (VISAPP 2022). February, 2022

[13] "A Novel Domain Transfer-Based Approach for Unsupervised Thermal Image Super-Resolution". Written with: Rafael E. Rivadeneira, Angel Domingo and Hammoud R. Sensors Journal. 2022

[14] "Cycle generative adversarial network: towards a low-cost vegetation index estimation". Written with: Patricia L. Suárez and Angel D. Sappa. IEEE International Conference on Image Processing (ICIP 2021) September, 2021

[15] "Thermal Image SuperResolution Challenge – PBVS 2021". Written with: Rivadeneira R.E., Sappa A.D., Nathan S., Kansal P. and Mehri A et al. IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops, CVPRW 2021. June, 2021.

[16] "Camera pose estimation in multi-view environments: from virtual scenarios to the real world" Written with: Charco, J.L., Sappa, A.D and Velesaca, H.O. Image and Vision Computing Journal. 2021

[17] "Deep learning-based vegetation index estimation" Written with: Patricia L. Suárez and Angel D. Sappa. Generative Adversarial Networks for Image-to-Image Translation Book. 2021

[18] "Thermal image super-resolution challenge - PBVS 2020" Written with: Rafael E. Rivadeneira; Angel D. Sappa; Lin Guo; Jiankun Hou; Armin Mehri; Parichehr Behjati; Ardakani Heena Patel; Vishal Chudasama; Kalpesh Prajapati; Kishor P. Upla; Raghavendra Ramachandra; Kiran Raja; Christoph Busch; Feras Almasri; Olivier Debeir; Sabari Nathan; Priya Kansal; Nolan Gutierrez; Bardia Mojra and William J. Beksi. IEEE Computer Society Conference on Computer Vision and Pattern Recognition Workshops. June, 2020

[19] "Thermal image super-resolution: A novel architecture and dataset". Written with: Rafael E. Rivadeneira and Angel D. Sappa. VISIGRAPP 2020 – Proceedings of the 15th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications. Valletta, Malta. February,2020

[20] "Transfer learning from synthetic data in the camera pose estimation problem". Written with: Jorge L. Charco; Angel D. Sappa and Henry O. Velesaca. VISIGRAPP 2020 – Proceedings of the 15th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications. Valletta, Malta. February,2020

[21] "Statistical Representations of a Dashboard to Monitor Educational Videogames in Natural Language" Written with: Nayeth I. Solorzano Alcivar, Robert Loor and Stalyn Gonzabay Yagual. ETLTC – ACM Chapter: International

Conference on Educational Technology, Language and Technical Communication. Japan. January, 2020

[22] "Thermal Image SuperResolution through Deep Convolutional Neural Network". Written with: Rafael E. Rivadeneira, Patricia L. Suárez and Angel D. Sappa. 16th International Conference on Image Analysis and Recognition (ICIAR 2019). Waterloo, Canada. August, 2019

[23] "Image Vegetation Index through a Cycle Generative Adversarial Network". Written with: Patricia L. Suárez, Angel D. Sappa and Riad I. Hammoud. (2019). Conference on Computer Vision and Pattern Recognition Workshops (CVPR 2019). Long Beach, California, United States. June 2019

[24] "Organ identification on shrimp histological images: A comparative study considering CNN and feature engineering". Written with: M. Mendieta; F. Panchana; B. Andrade; B. Bayot; C. Vaca; D. G. Romero. IEEE Ecuador Technical Chapters Meeting ETCM 2018, Cuenca, Ecuador, October 2018

[25] "Near InfraRed Imagery Colorization". Written with: Patricia L. Suarez, Angel D. Sappa and Riad I. Hammoud. 25 th IEEE International Conference on Image Processing ICIP 2018, Athens, Greece, October 2018

[26] "Vegetation Index Estimation from Monospectral Images". Written with: Patricia L. Suarez and Angel D. Sappa. 15th International Conference, Image Analysis and Recognition ICIAR 2018, Póvoa de Varzim, Portugal, June 2018. Lecture Notes in Computer Science, vol 10882, pp 353-362. https://doi.org/10.1007/978-3-319-93000-8_40

[27] "Deep Learning based Single Image Dehazing". Written with: Patricia L. Suarez, Angel D. Sappa and Riad I. Hammoud. 14th IEEE Workshop on Perception Beyond the Visible Spectrum – In conjunction with CVPR 2018. Salt Lake City, Utah. USA. June 2018

[28] "Adaptive Harris Corners Detector Evaluated with Cross-Spectral Images". Written with: Patricia L. Suarez and Angel D. Sappa. International Conference on Information Technology & Systems. January 2018. https://doi.org/10.1007/978-3-319-73450-7_69

[29] "Learning Image Vegetation Index through a Conditional Generative Adversarial Network". Written with: Patricia L. Suarez and Angel D. Sappa. 2nd IEEE Ecuador Tehcnnical Chapters Meeting (ETCM). October 2017. DOI: 10.1109/ETCM.2017.8247538

[30] "Colorizing Infrared Images through a Triplet Condictional DCGAN Architecture". Written with: Patricia L. Suarez and Angel D. Sappa. 19th International Conference on Image Analysis and Processing (ICIAP 2017). Catania, Italy. September 2017. https://doi.org/10.1007/978-3-319-68560-1_26

[31] "Infrared Image Colorization based on a Triplet DCGAN Architecture". Written with: Patricia L. Suarez and Angel D. Sappa. In 13th IEEE Workshop on Perception Beyond the Visible Spectrum – In conjunction with CVPR 2017. (This paper has been selected as "Best Paper Award"). Honolulu, HI, USA. July 2017. DOI: 10.1109/CVPRW.2017.32

[32] "Learning to Colorize Infrared Images". Written with: Patricia L. Suarez and Angel D. Sappa. 15th International Conference on Practical Applications of Agents and Multi-Agent Systems (PAAMS 2017), pp. 164-172. July 2017. https://doi.org/10.1007/978-3-319-61578-3_16

[33] "An Empirical Comparison of DCNN libraries to implement the Vision Module of a Danger Management System", Written with: Sianna Puente, Cindy Madrid and Miguel Realpe. 2017 International Conference on Deep Learning Technologies (ICDLT 2017), pp. 60-65, Chengdu, China. June 2017. DOI: 10.1145/3094243.3094252.

[34] "A Dijkstra-based algorithm for selecting the Shortest-Safe Evacuation Routes in dynamic environments (SSER) ". Written with: Angely Oyola and Dennis G. Romero. 30th International Conference on Industrial, Engineering, Other Applications of Applied Intelligent Systems (IEA/AIE 2017). Arras, France. June 2017. https://doi.org/10.1007/978-3-319-60042-0_15

[35] "Cross-spectral Image Patch Similarity using Convolutional Neural Network". Written with: Patricia L. Suarez and Angel D. Sappa. 2017 IEEE International Workshop of Electronics, Control, Measurement, Signals and their application to Mechatronics (ECMSM). San Sebastian, Spain. pp. 1-5. May 2017. DOI: 10.1109/ECMSM.2017.7945888

[36] "Multi-sensor Fusion Module in a Fault Tolerant Perception System for Autonomous Vehicles," Written with: Miguel Realpe and Ljubo Vlacic. Journal of Automation and Control Engineering (JOACE), Vol. 4, No. 6, pp. 430-436, December 2016. ISSN: 2301-3702.

[37] "Monocular visual odometry: a cross-spectral image fusion based approach", Written with: A. Sappa, C. A. Aguilera, J. A. Carvajal, M. Oliveira, D. Romero and R. Toledo. Journal of Robotics and Autonomous Systems, Vol. 85, pp. 26–36, November 2016. DOI: 10.1016/j.robot.2016.08.005.

[38] "Multi-sensor Fusion Module in a Fault Tolerant Perception System for Autonomous Vehicles". Written with: Miguel Realpe and Ljubo Vlacic. 2016 2nd International Conference on Robotics and Artificial Intelligence (ICRAI 2016), Los Angeles, USA. April 2016.

[39] "A Fault Tolerant Perception system for autonomous vehicles", Written with: Miguel Realpe and Ljubo Vlacic. 35th Chinese Control Conference (CCC2016), International Conference on, Chengdu. pp. 6531-6536, July 2016.

[40] "Wavelet-Based Visible and Infrared Image Fusion: A Comparative Study". Written with: Sappa, A.D.; Carvajal, J.A.; Aguilera, C.A.; Oliveira, M. and Romero, D. Sensors Journal, 16 (6), No 861, pp. 517-528, 2016.

[41] "A Visible-Thermal Fusion based Monocular Visual Odometry". Written with J. Poujol, C. Aguilera-Carrasco, E. Danos, R. Toledo, and A. Sappa. Iberian Robotics Conference (ROBOT 2015), Lisbon, Portugal, November 2015.

[42] "A predictive model for human activity recognition by observing actions and context". Written with D.G. Romero; A. Frizera; A. D. Sappa and T.F. Bastos. ACIVS 2015 (Advanced Concepts for Intelligent Vision Systems),

Catania, Italia, October 2015.

[43] "Sensor Fault Detection and Diagnosis for autonomous vehicles". Written with M. Realpe and L. Vlacic. 2nd International Conference on Mechatronics, Automation and Manufacturing (ICMAM 2015), Singapur, Singapur, October 2015.

[44] "Anàlisis del movimiento de las extremidades superiores aplicado a la rehabilitación física de una persona usando técnicas de visión artificial". Written with M. Velarde, E. Perugachi, D. Romero and A. Sappa. Revista Tecnológica ESPOL-RTE, August 2015

[45] "Towards Fault Tolerant Perception for autonomous vehicles: Local Fusion". Written with M. Realpe and L. Vlacic. 7th IEEE International Conference on Robotics, Automation and Mechatronics – RAM, Angkor Wat, Cambodia, July 2015.

[46] "Cross-spectral image registration and fusion: an evaluation study". Written with M. Cruz, C. Aguilera-Carrasco, and R. Toledo and A. Sappa. 2nd International Conference on Machine Vision and Machine Learning, Barcelona, Spain, July 2015.

[47] "Feature Point Descriptors: Infrared and Visible Spectra". Written with Pablo Ricaurte, Carmen Chilán, Cristhian A. Aguilera-Carrasco and Angel D. Sappa. Sensors Journal 2014, Vol 14, No 2, pp. 3690-3701; doi:10.3390/s140203690, ISSN:1424-8220, February 2014.

[48] "Performance Evaluation of Feature Point Descriptors in the Infrared Domain ". Written with Pablo Ricaurte, Carmen Chilán, Cristhian A. Aguilera-Carrasco and Angel D. Sappa. International Conference on Computer Vision Theory and Applications – VISAPP 2014, Lisbon, Portugal, ISBN: 978-989-758-004-8, January 2014.

[49] "Cross-Spectral Stereo Correspondence using Dense Flow Fields". Written with N. Onkarappa, C. Aguilera-Carrasco and A. Sappa. International Conference on Computer Vision Theory and Applications – VISAPP 2014, Lisbon, Portugal, ISBN: 978-989-758-004-8, January 2014.

[50] "An approach to Automatic Assistance on physiotherapy based on on-line Movement Identification". Written with D. Romero, Frizera A. and Bastos T. Acepted for publication in Andean Region International Conference – IEEE-ANDESCON2012, Cuenca, Ecuador, November 2012.

[51] "RWE Patterns Extraction for on-line Human Action Recognition through Window-Based Analysis of Invariant Moments". Written with D. Romero, Frizera A. and Bastos T. 5th Workshop in applied Robotics and Automation (Robocontrol), Baurú, Brasil, ISSN: 1981-8602, June 2012.

[52] "Detección y extracción de placas de vehículos en señales de video". Written with H. Rodriguez S. and R. Vera S. Revista Tecnológica ESPOL-RTE, Vol. 25, núm. 1: Aplicaciones Ingenieriles, October 2012.

[53] "Análisis de comportamiento humano: Metodología para localización y seguimiento de personas en secuencias de video". Written with M.A. Realpe, D. Romero and P. Remagnino. Conferencia Iberoamericana en Sistemas, Cibernética e Informática, Orlando, USA, July 2009.

[54] "Edge point linking by means of global and local schemes". Written with A.D. Sappa. Book chapter in Signal Processing for Image Enhancement and Multimedia Processing, Ed. E. Damiani et al., Springer, Vol. 31, pp. 115-126, ISBN 978-0-387-72499-7, 2008.

[55] "Detection of individual specimens in populations using contour energies". Written with D. Ochoa and S. Gautama. Advanced Concepts for Intelligent Vision Systems - ACIVS 2007, pp 575-586, Delft, Netherlands. Springer LNCS 4678 series, ISBN 978-3-540-74606-5, August 2007.

[56] "Contour energy features for recognition of biological specimens in population images". Written with D. Ochoa and S. Gautama. International Conference on Image Analysis and Recognition - ICIAR 2007, pp. 1061-1070, Montreal, Canada, Springer LNCS 4633 series, ISBN 978-3-540-74258-6, August 2007.

[57] "Cost-based closed contour representations". Written with A.D. Sappa. SPIE Journal of Electronic Imaging - JEI, Vol. 16, I 2, 023009, ISSN 1017-9909, April 2007.

[58] Mosaicing cluttered ground planes based on stereo vision", Written with J. Gaspar, M.A. Realpe and J.Santos-Victor. 3rd Iberian Conference on Pattern Recognition and Image Analysis - IbPRIA 2007, pp. 17-24, Girona, Spain, Springer LNCS series, June 2007.

[59] "Edge point linking by means of global and local schemes". Written with A.D. Sappa. IEEE International Conference on Signal-Image Technology and Internet-based Systems – SITIS 2006, pp.551 - 560, Hammamet, Tunisia. ISBN: 2-9525435-1, December 2006.

[60] "MediRobot – Sistema de comunicación para interacción remota médico–paciente". Written with D. Romero. II Congreso Nacional de Investigación, Tecnología e Innovación, Guayaquil, Ecuador. ISSN: 13902997, November 2006.

[61] "Localización y Mapeo Simultaneo con Imágenes 3D a Color". Written with M.A. Realpe, J. Gaspar and J.Santos-Victor. Revista Tecnológica, Vol. 19, No. 1, 99-106, Ecuador. ISSN: 0257-1749, October 2006.

[62] "Detection of isolated nematodes in clutter environments using shape feature histograms". Written with D. Ochoa and S. Gautama. International Conference on Computer Vision Theory and Applications - VISAPP, Vol.1, pp. 486-491, Portugal. ISBN: 972-8865-40-6, February 2006.

[63] "Response histogram analysis for isolated nematode detection". Written with D. Ochoa and S. Gautama. IEEE

BENELUX/DSP Valley Signal Processing Symposium - SPS-DARTS 2006, pp. 11-14, Belgium, March 2006.

[64] "Modelado 3D de Superficies Mediante Visión Estereo". Written with M.A. Realpe. 1er Congreso Nacional de Investigación, Tecnología e Innovación, Quito, Ecuador, October 2005.

[65] "Reconocimiento y Seguimiento de Objetos Móviles". Written with J.A. Chicala, R.F. Jacho and L.F. Atiencia. 1er Congreso Nacional de Investigación, Tecnología e Innovación, Quito, Ecuador, October 2005.

[66] "Building the TRL-I Microrobot". Written with D. Paillacho and V. Salamea. 2004 FIRA Robot World Congress, Busan, Korea, October 2004.

[67] "Univector Fields for Motion Control in Mirosot Robots". Written with C. Villarroel, C. Calderón and R. Carrillo. 2003 FIRA Robot World Congress, Vienna, Austria. ISBN: 3-902161-02-7, October 2003.

[68] "TRL-I Microrobot Control Module". Written with D. Paillacho and V. Salamea. 2003 FIRA Robot World Congress, Vienna, Austria. ISBN: 3-902161-02-7, October 2003.

[69] "Control de Movimiento de los Micro-Robots en la MIROSOT". Written with C. Villarroel, C. Calderón and R. Carrillo. Revista Tecnológica, Vol. 16, No.1, 24-33. ISSN: 0257-1749, June 2003.

[70] "Sistemas multiagentes aplicados al futbol robotico: problemática existente". Written with C. Monsalve, C. Villarroel S., C. Calderón G., R. Carrillo C., V. Salamea, D. Paillacho. J. Chicala, L. Atiencia and R. Jacho. IV Jornadas Iberoamericanas de Robótica, Seminario 3, Panamá, January 2003.

[71] "Hacia la construccion de un micro-robot". Written with D. Paillacho, V. Salamea, C. Monsalve and F. Novillo. IV Jornadas Iberoamericanas de Robotica, Seminario 3, Panamá, January 2003.

[72] "Survey on Learning in Multi-Agent Systems". Written with C. Villarroel, C. Calderón and R. Carrillo. Book chapter: Intelligent Robots: Vision, Learning and Interaction, Section: Learning for Navigation and Control, Editorial: KAIST Press, Korea, 91-96, ISBN: 89-89453-02-X-93560, 2003.

• "Survey on Learning in Multi-Agent Systems". Written with C. Villarroel, C. Calderón and R. Carrillo. 2002 FIRA Robot World Congress, Seoul, Korea, 305-308. ISBN: 89-86522-47-0-93560, May 2002.

[73] "Integración de Mallas Triangulares 2½ D". Written with M.A.Garcia. to appear in Conferencia Iberoamericana en Sistemas, Cibernética e informática, Orlando, Florida, USA, July 2002.

[74] "Estudio Bibliográfico sobre Sistemas de Reconocimiento Facial". Written with S. Erique and W. Silvestre. to appear in Conferencia Iberoamericana en Sistemas, Cibernética e informática, Orlando, Florida, USA, July 2002.

[75] "Approximation and Geometric Processing of Digital Images with Adaptive Triangular Meshes". PhD thesis, Universidad Politécnica de Cataluña, Barcelona, Spain. ISBN: 8469968882. January 2001.

[76] "Acceleration of Thresholding and Labeling Operations through Geometric Processing of Gray-Level Images". Written with M.A.Garcia. 15th IAPR International Conference on Pattern Recognition, Barcelona, Spain, pp. 429-432, September 2000.

[77] "Acceleration of Filtering and Enhancement Operations through Geometric Processing of Gray-Level Images". Written with M.A.Garcia. IEEE International Conference on Image Processing, Vancouver, Canada, September 2000

[78] "Approximation and Processing of Intensity Images with Discontinuity-Preserving Adaptive Triangular Meshes". Written with M.A.Garcia and A.D. Sappa. Sixth European Conference on Computer Vision, Dublin, Ireland, pp. 844-855, July 2000.

• Also published as Technical Report in: Institut d´Organització i Control de Sistemes Industrials, Universitat Politècnica de Catalunya, IOC-DT-P-1999-09, Barcelona, España, June 1999.

[79] "Geometric and Topological Lossy Compression of Dense Range Images". Written with M.A.Garcia and A.D. Sappa. IEEE International Conference on Image Processing, Vancouver, Canada, September 2000.

• Also published as Technical Report in: Institut d´Organització i Control de Sistemes Industrials, Universitat Politècnica de Catalunya, IOC-DT-P-1999-07, Barcelona, Spain, March 1999

[80] "Approximation of Intensity Images with Adaptive Triangular Meshes: Towards a Processable Compressed Representation". Written with M.A.Garcia and A.D. Sappa. Irish Machine Vision and Image Processing Conference, Dublin, Ireland, pp. 241-249, September 1999.

• Also published as Technical Report in: Institut d´Organització i Control de Sistemes Industrials, Universitat Politècnica de Catalunya, IOC-DT-P-1998-16, Barcelona, Spain, 1998.

[81] "Efficient Approximation of Gray-Scale Images through Bounded Error Triangular Meshes". Written with M.A.Garcia and A.D. Sappa. IEEE International Conference on Image Processing, Kobe, Japan, October 1999.

• Also published as Technical Report in: Institut d´Organització i Control de Sistemes Industrials, Universitat Politècnica de Catalunya, IOC-DT-P-1999-08, Barcelona, Spain, April 1999.

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(1) The topics of these papers are focused on areas such as: digital image processing, computer vision, robotics and machine learning.

INVITED PARTICIPATION IN CONFERENCES AND SEMINARIES:

- "3D Human Pose Estimation based on deep learning techniques from Multi-view environments ", Charlas ACHIRP: Asociación Chilena de Reconocimiento de Patrones (ACHIRP), Online-Chile, April 2021.
- "Automatic recognition of lepidopteran specimens based on convolutional neuronal networks", Jornadas académicas, científicas y de innovación 2017, UTEQ University, Quevedo, Ecuador, January 2017.
- "Detection of object movement based on artificial vision", First Scientific Conference on Information Technology, UTC University, La Maná, Ecuador, July 2016.
- "Detection and Tracking of Human Motion Body Using Artificial Vision", II Workshop on Robotics, Automation and Control, EPN University, Quito, Ecuador, September 2012.
- "Human Motion Analysis based on Computer Vision", Faculty of Electrical and Computer Engineering, ESPOL University, Guayaquil, Ecuador, November 2009.
- "Shadow Removal: foreground segmentation", Digital Imaging Research Centre, Kingston University, England, UK, 2009. http://archive.li/0s1pI#selection-4817.8-4817.20
- "Approximation and Processing of Digital Images using Adaptive Triangular Meshes", Digital Imaging Research Centre, Kingston University, England, UK, 2008. http://archive.li/0s1pI#selection-4817.8-4817.20
- "Tracking and Recognition of Mobile Object based on HSI space ", Technical Sessions on Artificial Vision and Robotics, RIBERO project (Red Iberoamericana de Robótica) and PARTI project (Programación Asistida de Robots para Tareas Industriales), Zaragoza University, Zaragoza, Spain, 2005.
- "Generation of Adaptive Triangular Meshes from Digital Images ", Technical Sessions on Artificial Vision and Robotics, RIBERO project (Red Iberoamericana de Robótica) and PARTI project (Programación Asistida de Robots para Tareas Industriales), Universidad de los Andes, Bogotá, Colombia, 2004.
- "Univector Fields for Motion Control in Mirosot Robots ", V Jornadas Iberoamericanas de Robótica, Seminary 3, Santa Cruz de la Sierra, Bolivia, 2004.
- "Multiagent Systems applied to Robots Soccer: Current Issue ", IV Jornadas Iberoamericanas de Robótica, Seminary 3, Panamá, 2003.

LEADERSHIP QUALITIES:

Feb. 2016 – present	**Member of the Academic Commission**: Master's Program in Computational Sciences (MCC), ESPOL University, Ecuador.
Feb. 2015 – 2019	**Member of the Academic Commission**: Doctoral Program in Computational and Applied Sciences (DCCA), ESPOL University, Ecuador.
Feb. 2010 – present	**Director**: Center for Research, Development and Innovation of Computational Systems (CIDIS), ESPOL University, Ecuador.
Sept. 2012 – Nov. 2014	**Academic Vice Chair, IEEE RAS-Ecuador**: Section Chapter, IEEE Robotics and Automation Society (IEEE RAS), Ecuador.
Nov. 2012 – Dec. 2014	**Vice Dean**: Faculty of Electrical and Computer Engineering (FIEC), ESPOL University, Ecuador.
Aug. 2005 – Sept. 2008	**Director**: Vision and Robotics Center (CVR), Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.
Aug. 2001 – July 2005	**Head**: Vision and Robotics Research Laboratory, Faculty of Electrical and Computer Engineering, ESPOL University, Ecuador.
Aug. 2004 – Jan. 2008	**Editor in Chief**: Scientific Magazine "Revista Tecnológica" (RTE), ESPOL University, Ecuador.
Mar. 2003 – Oct. 2008	**Principal Member**: Research Council at the ESPOL University, Ecuador.
Oct. 2006 – Sept. 2008	**Local responsible** in project cooperation: Technical cooperation from Korea government: Korea Overseas Volunteers (KOVs) program, funded by Korea International Cooperation Agency (KOICA), Korea.

Mar. – Jul. 2005	**Founder**: Vision and Robotics Center (CVR), ESPOL University, Ecuador.