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Semillero de investigación: "Bioinstrumentación SIBIONS"  
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## Resultado de la investigación

**A data-driven approach to physical fatigue management using wearable sensors to classify four diagnostic fatigue states**  
Pinto-Bernal, M. J., Cifuentes, C. A., Perdomo, O., Rincón-Roncancio, M. & Múnera, M., sept. 25 2021, En: *Sensors*. 21, 19, 6401.

### **Machine learning approach for fatigue estimation in sit-to-stand exercise**

Aguirre, A., Pinto, M. J., Cifuentes, C. A., Perdomo, O., Díaz, C. A. R. & Múnera, M., jul. 23 2021, En: *Sensors*. 21, 15, 5006.

### **Clustering Proposal Support for the COVID-19 Making Decision Process in a Data Demanding Scenario**

Orjuela-Cañón, A. D. & Perdomo Charry, O. J., jun. 10 2021, *IEEE Latin America Transactions*, 19, 6, p. 1041 - 1049 8 p.

### **A deep learning model for classification of diabetic retinopathy in eye fundus images based on retinal lesion detection**

DelaPava, M., Ríos, H., Rodríguez, F. J., Perdomo, O. J. & González, F. A., 2021, *17th International Symposium on Medical Information Processing and Analysis*. Romero, E., Costa, E. T., Brieva, J., Rittner, L., Linguraru, M. G. & Lepore, N. (eds.). SPIE, 120880T. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 12088).

### **Intensive Care Unit Occupancy Time Series Forecasting for COVID-19 Pandemic**

Orjuela-Canon, A. D., Perdomo, O., Mendoza, L. & Valencia, C. H., 2021, *2021 IEEE 2nd International Congress of Biomedical Engineering and Bioengineering, CI-IB and BI 2021*. Institute of Electrical and Electronics Engineers Inc., (2021 IEEE 2nd International Congress of Biomedical Engineering and Bioengineering, CI-IB and BI 2021).

### **Monitoring and Evaluation of People in Indoors and Outdoors Using Deep Learning**

Cruz, B. S., Aguía, K. & Perdomo, O. J., 2021, *17th International Symposium on Medical Information Processing and Analysis*. Romero, E., Costa, E. T., Brieva, J., Rittner, L., Linguraru, M. G. & Lepore, N. (eds.). SPIE, 120880V. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 12088).

### **What You Need to Know About Artificial Intelligence: Technical Introduction**

Perdomo Charry, O. J., Orjuela-Cañón, A. D., González-Osorio, F. A. & Toledo-Cortés, S., 2021, *What You Need to Know About Artificial Intelligence: Technical Introduction*. Springer, p. 13-25 13 p. 2. (Current Practices in Ophthalmology).

### **A Conditional Generative Adversarial Network-Based Method for Eye Fundus Image Quality Enhancement**

Pérez, A. D., Perdomo, O., Ríos, H., Rodríguez, F. & González, F. A., nov. 20 2020, *Ophthalmic Medical Image Analysis - 7th International Workshop, OMIA 2020, Held in Conjunction with MICCAI 2020, Proceedings*. Fu, H., Garvin, M. K., MacGillivray, T., Xu, Y. & Zheng, Y. (eds.). Springer Science and Business Media Deutschland GmbH, Vol. 12069. p. 185-194 10 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 12069 LNCS).

### **Hybrid Deep Learning Gaussian Process for Diabetic Retinopathy Diagnosis and Uncertainty Quantification**

Toledo-Cortés, S., de la Pava, M., Perdomo Charry, O. J. & González, F. A., nov. 20 2020, *Ophthalmic Medical Image Analysis - 7th International Workshop, OMIA 2020, Held in Conjunction with MICCAI 2020, Proceedings*. Fu, H., Garvin, M. K., MacGillivray, T., Xu, Y. & Zheng, Y. (eds.). Springer Science and Business Media Deutschland GmbH, p. 206-215 10 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 12069 LNCS).

### **Automatic estimation of pose and falls in videos using computer vision model**

Calvache Briceño, D. A., Bernal, H. A., Guarín, J. F., Aguía, K., Orjuela-Cañón, A. D. & Perdomo, O. J., nov. 3 2020, *16th International Symposium on Medical Information Processing and Analysis*. Romero, E., Lepore, N., Brieva, J. & Linguraru, M. (eds.). SPIE, 115830W. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 11583).

### **Comparison of machine learning models for the prediction of cancer cells using MHC class I complexes**

Author, M. N., Author, Á. D. O. C. & Charry, O. J. P., nov. 3 2020, *16th International Symposium on Medical Information Processing and Analysis*. Romero, E., Lepore, N., Brieva, J. & Linguraru, M. (eds.). SPIE, 115830M. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 11583).

### **Segmentation of retinal fluids and hyperreflective foci using deep learning approach in optical coherence tomography scans**

Sanchez, Y. D., Quijano, B., Padilla, F. D., Perdomo, O. & González, F. A., nov. 3 2020, *16th International Symposium on Medical Information Processing and Analysis*. Romero, E., Lepore, N., Brieva, J. & Linguraru, M. (eds.). SPIE, 115830H. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 11583).

### **SOPHIA: Sistema para adquisición, transmisión, y análisis inteligente de imágenes oftálmicas**

Perdomo-Charry, O. J., Pérez, A. D., de-la-Pava-Rodríguez, M., Ríos-Calixto, H. A., Arias-Vanegas, V. A., Lara-Ramírez, J. S., Toledo-Cortés, S., Camargo-Mendoza, J. E., Rodríguez-Alvira, F. J. & González-Osorio, F. A., sept. 29 2020, En: *Revista Facultad de Ingeniería*. 29, 54

### **Convolutional neural network proposal for wrist position classification from electromyography signals**

Orjuela-Canon, A. D., Perdomo-Charry, O. J., Valencia-Nino, C. H. & Forero, L., ago. 7 2020, *2020 IEEE Colombian Conference on Applications of Computational Intelligence, ColCACI 2020 - Proceedings*. Orjuela-Canon, A. D. (ed.). Institute of Electrical and Electronics Engineers Inc., 9247924. (2020 IEEE Colombian Conference on Applications of Computational Intelligence, ColCACI 2020 - Proceedings).

### **A lightweight deep learning model for mobile eye fundus image quality assessment**

Pérez, A. D., Perdomo Charry, O. J. & González, F. A., ene. 3 2020, *15th International Symposium on Medical Information Processing and Analysis*. Romero, E., Lepore, N. & Brieva, J. (eds.). SPIE, 113300K. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 11330).

### **Monitoring of Critical Variables in the Imaging Service from the Internet of Things (IoT)**

Cadena, O. P., Preciado, C. G., Cruz, A. N., Hernández, N. P. C., Beltran, A., Sarmiento-Rojas, J., Quiroga-Torres, D. A., Perdomo Charry, O. J. & Aya-Parra, P. A., ene. 1 2020, *8th Latin American Conference on Biomedical Engineering and 42nd National Conference on Biomedical Engineering - Proceedings of CLAIB-CNIB 2019*. González Díaz, C. A., Chapa González, C., Laciár Leber, E., Vélez, H. A., Puente, N. P., Flores, D-L., Andrade, A. O., Galván, H. A., Martínez, F., García, R., Trujillo, C. J. & Mejía, A. R. (eds.). Springer, p. 1326-1332 7 p. (IFMBE Proceedings; vol. 75).

### **Una revisión sistemática de métodos de aprendizaje profundo aplicados a imágenes oculares**

Perdomo Charry, O. J., nov. 8 2019, En: *Ciencia e Ingeniería Neogranadina*.

### **Sistema basado en internet de las cosas (IoT) para la monitorización en tiempo real de variables de temperatura y humedad en un equipo de refrigeración de área de farmacia de un hospital de cuarto nivel**

Quiroga Torres, D. A., Baquero Soto, A. B., Ballesteros Coral, D. S., Aya Parra, P. A., Bernal Muñoz, H. A., Sarmiento Rojas, J. S., Córdoba-Hernández, N. P., Beltran, A., Cruz, A. N. & Perdomo Charry, O. J., sept. 10 2019, *Retos en la formación de ingenieros en la era digital*. p. 1-9 9 p.

### **Classification of diabetes-related retinal diseases using a deep learning approach in optical coherence tomography**

Perdomo, O., Rios, H., Rodríguez, F. J., Otálora, S., Meriaudeau, F., Müller, H. & González, F. A., sept. 2019, En: *Computer Methods and Programs in Biomedicine*. 178, p. 181-189 9 p.

### **Automated Diabetic Macular Edema (DME) analysis using fine tuning with inception-resnet-v2 on oct images**

Kamble, R. M., Kokare, M., Chan, G. C. Y., Perdomo, O., González, F. A., Müller, H. & Mériaudeau, F., ene. 24 2019, *2018 IEEE EMBS Conference on Biomedical Engineering and Sciences, IECBES 2018 - Proceedings*. Institute of Electrical and Electronics Engineers Inc., p. 442-446 5 p. 8626616. (2018 IEEE EMBS Conference on Biomedical Engineering and Sciences, IECBES 2018 - Proceedings).

### **A method to detect potentially malignant skin lesions through image segmentation**

Wilches, C. A., Perdomo, Ó. J. & Perdomo, C. A., 2019, En: *IFMBE Proceedings*. 68, 1, p. 289-293 5 p.

### **Automated Diabetic Macular Edema (DME) Analysis Using Fine Tuning with Inception-Resnet-v2 on OCT Images**

Kamble, R. M., Chan, G. C. Y., Perdomo, O., Gonzralez, F. A., Kokare, M., Muller, H. & Mreiaudeau, F., jul. 1 2018, En: Conference proceedings : ... Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual Conference. 2018, p. 2715-2718 4 p.

### **Determining the scale of image patches using a deep learning approach**

Otalora, S., Perdomo, O., Atzori, M., Andersson, M., Jacobsson, L., Hedlund, M. & Muller, H., may. 23 2018, *2018 IEEE 15th International Symposium on Biomedical Imaging, ISBI 2018*. IEEE Computer Society, p. 843-846 4 p. (Proceedings - International Symposium on Biomedical Imaging; vol. 2018-April).

### **3D deep convolutional neural network for predicting neurosensory retinal thickness map from spectral domain optical coherence tomography volumes**

Perdomo, O. J., Rios, H. A., Rodríguez, F. J. & González, F. A., 2018, *14th International Symposium on Medical Information Processing and Analysis*. Lepore, N., Romero, E. & Brieua, J. (eds.). SPIE, 109750I. (Proceedings of SPIE - The International Society for Optical Engineering; vol. 10975).

### **Detección de la posición corporal en el sueño a partir de la medición de la temperatura**

Perdomo Charry, O. J. & Rodríguez Cediél, A. C., 2018.

### **Glaucoma Diagnosis from Eye Fundus Images Based on Deep Morphometric Feature Estimation**

Perdomo, O., Andrearczyk, V., Meriaudeau, F., Müller, H. & González, F. A., 2018, *Computational Pathology and Ophthalmic Medical Image Analysis - First International Workshop, COMPAY 2018, and 5th International Workshop, OMIA 2018, Held in Conjunction with MICCAI 2018, Proceedings*. Taylor, Z., Bogunovic, H., Snead, D., Garvin, M. K., Chen, X. J., Ciompi, F., Xu, Y., Maier-Hein, L., Veta, M., Trucco, E., Stoyanov, D., Rajpoot, N., van der Laak, J., Martel, A. & McKenna, S. (eds.). Springer, p. 319-327 9 p. (Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics); vol. 11039 LNCS).

### **Pilot study: Biomechanical assessment of the plantar pressure distribution in healthy subjects using the pressure platform EcoWalk**

Zequera, M., Perdomo, O., Wilches, C. & Vizcaya, P., dic. 2013, En: *International Journal of Engineering and Technology*. 13, 6, p. 97-101 5 p.

### **Modeling and simulation of ventricular repolarization or T-wave of ECG of subjects with type 1 diabetes during adrenaline infusions**

Perdomo Charry, O. J., oct. 8 2013, *Health Care Exchanges (PAHCE), 2013 Pan American*.

### **Modelado y simulación de la repolarización ventricular u onda T del ECG de individuos con diabetes tipo 1 durante infusión de adrenalina**

Perdomo, O. J., Perdomo, C. A. & Marques, J. L., 2013, *2013 Pan American Health Care Exchanges, PAHCE 2013 - Conference, Workshops, and Exhibits. Cooperation / Linkages: An Independent Forum for Patient Care and Technology Support*. 6568237. (Pan American Health Care Exchanges, PAHCE).

### **Pilot study: Assessing repeatability of the EcoWalk platform resistive pressure sensors to measure plantar pressure during barefoot standing**

Zequera, M., Perdomo, O., Wilches, C. & Vizcaya, P., 2013, En: *Journal of Physics: Conference Series*. 450, 1, 012029.

### **Modelagem matemática e avaliação de novos parâmetros para estudo do efeito de fármacos na repolarização ventricular em indivíduos com diabetes**

Perdomo Charry, O. J., 2012, En: *Universidade Federal de Santa Catarina*.

### **Morphological analysis of T-wave in vectorcardiographic leads system by a bi-Gaussian approach in patients under effect of salbutamol**

Perdomo, O. J., Robinson, E. J., Suzuki, D. O. H., Heller, S. R. & Marques, J. L. B., 2012, *2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBC 2012*. p. 5494-5497 4 p. 6347238. (Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society, EMBS).

## Actividades

### **32nd Annual Conference of the International Society for Environmental Epidemiology**

Ana Maria Barragan Gonzalez (Participante), Daniel Alejandro Buitrago Medina (Participante), Oscar Julian Perdomo Charry (Participante), Luisa Fernanda Londoño Tobón (Participante), Carlos Andres Moya Ortiz (Participante), Mariana Ospina Espinosa (Participante), Santiago Noriega Ramírez (Participante), Isabella Hernandez Duarte (Participante), Sofia De Brigard Cabal (Participante), Catalina Rojas Reyes (Participante) & Sara Juliana Guerrero Leon (Participante)  
ago. 27 2020

## Proyectos

### **Ambiente y Salud**

Barragan Gonzalez, A. M., Buitrago Medina, D. A., Londoño Tobón, L. F., Moya Ortiz, C. A., Rojas Reyes, C., Ospina Espinosa, M., Noriega Ramírez, S., Hernandez Duarte, I., De Brigard Cabal, S., Guerrero Leon, S. J., Orjuela Cañón, A. D. & Perdomo Charry, O. J.  
5/4/20 → 11/30/21

### **Desarrollo de un dispositivo para la medición de la presión estática inspiratoria y espiratoria máxima**

Perdomo Charry, O. J. & Vargas Pinilla, O. C.  
1/12/21 → 1/11/22

### **Expresión de emociones y esquizofrenia: sistema para el reconocimiento de emociones en el habla a través de técnicas de inteligencia artificial**

Rodriguez Duenas, W. R., Perdomo Charry, O. J. & Martinez Rodriguez, A.  
8/17/21 → 8/17/22

### **Herramienta automática para análisis de actividades cotidianas en un ambiente residencial a través de técnicas de inteligencia artificial**

Orjuela Cañón, A. D., Aguiá Rojas, K. & Perdomo Charry, O. J.  
9/20/19 → 4/19/21

### **Método Alternativo para la Detección de Lactato en Solución Acuosa Basado en la Fluorescencia de los Puntos de Carbono**

Orjuela Cañón, A. D., Perdomo Charry, O. J., Rodriguez Burbano, D. C. & Martín Rodríguez, E.  
9/1/21 → 7/8/22

### **Programa de promoción y prevención de los síndromes geriátricos en el adulto mayor basado en un algoritmo de evaluación / Programa de promoción y prevención de los síndromes geriátricos en el adulto mayor.**

Martinez Rodriguez, A., Vallejo Silva, A., Torres Narvaez, M. R., Chavarro-Carvajal, D. A., Perdomo Charry, O. J., Orjuela Cañón, A. D. & Venegas, L. C.  
1/20/22 → 1/19/23

### **Validación de un sistema de monitoreo y supervisión de equipos de refrigeración bajo el paradigma de Internet de las Cosas (IoT)**

Sarmiento Rojas, J. S., Aya Parra, P. A. & Perdomo Charry, O. J.  
5/1/21 → 5/2/22