

## CNIB2024-Trabajos Aceptados

### Artificial Intelligence, Modeling and Simulation of Biological Systems, Bioinformatics and Computational Biology.

| #ID | Authors  | Title   |
|-----|--|---|
| 4   | Fabian Cienfuegos Caraveo, Karely Alejandra Alvarez Cruz, Marianna Pacheco Quintana, Elma Natalia Romero Ramos, Celia María Quiñonez Flores and Carlos Eduardo Cañedo Figueroa                         | ML Design in Handwriting Analysis for Prediction of Alzheimer's Disease   |
| 6   | Denisse Vázquez Barriga, Alma Cassandra Loya Hernández, Marcela Vargas Méndez, Ayleen Marcela Zapata Zurita and Carlos Eduardo Cañedo Figueroa   | Machine learning for classification of electrooculography signals in the detection of visual fatigue syndrome   |
| 12  | Lennin Eduardo Figueroa-Gil, Ivana Valeria López-Cons and Álvaro David Orjuela-Cañón   | Machine Learning Techniques for Classifying Cardiac Arrhythmias   |
| 19  | Axel Yahir Ramirez-Angel, Ruben Saul Jimenez-Fernandez and Alvaro David Orjuela-Cañón  | Tuberculosis detection comparative of chest x-ray in preprocessed and non-preprocessed images.  |
| 20  | Daniel Santiago Calderon Rodriguez, Andrea Carolina Corredor Bedoya and Carlos Andres Coy Barrera  | Exploration of the Therapeutic Potential of Quercetin and Its Derivatives in Breast Cancer Treatment: A Focus on Croton   |
| 28  | Dan Sidney Díaz Guerrero, Fernando Montoya, Alberto Darszon and Gabriel Corkidi  | Human sperm flagellar 3D fractal dimension as hyperactivation indicator   |
| 35  | Odin Ramirez-Fernandez, Esmeralda Zuñiga-Aguilar and Esmeralda Zuñiga-Aguilar  | Design and development of a Bone-on-a-chip system to generate microphysiologic models   |
| 49  | Ricardo Legorreta, Odin Ramirez and Esmeralda Zuñiga   | Desing and caracterizacion of an organ- on-chip (ooc) and microfluidic system for liver   |
| 56  | Rafael Bayareh Mancilla, Alejandro Miguel Hernández Vázquez, Yazmín Mariela Hernández Rodríguez, Fausto David Cortes Rojas and Oscar Eduardo Cigarroa Mayorga  | Automated Mammogram Analysis for Microcalcification Identification using Convolutional Neural Networks  |
| 58  | Gerardo Ortíz, Omar Piña and Lesny Ocampo  | Classification of Post-Preeclampsic Mexican Women Using ECG and PPG Detrended Fluctuation Analysis: A Pilot Study   |
| 70  | Alberto Isaac Perez Sanpablo and Alicia Meneses Peñalosa   | Assessment of the Quality and Readability of AI-Generated Wheelchair Information  |
| 74  | Saul Muñoz Herrera and Omar Paredes  | Leveraging Graph Theory for Advanced Embryo Stage Identification in Assisted Reproductive Technologies  |
| 83  | Katya Fuentes-Sánchez, Misael Ávila-López, María García-Santiago, Dalia Dominguez-Jimenez, Oscar Morales-Toledo, Uciel Paso-Ramos and Jose Eduardo Chairez Veloz                                       | Understanding the role that genes play on the underlying Genetic Regulatory Network (GRN) of macrophage polarization in the context of Chronic Lymphocytic Leukemia |
| 85  | Mariana Álvarez-Carvajal, José Javier Reyes-Lagos, Adriana Herlinda Vilchis González, Sonia Pujol and Iván Francisco-Valencia  | Classification and Segmentation of Magnetic Resonance Images for Parkinson's Disease Studies Using K-means and Neural Networks to Segment the Subthalamic Nucleus   |
| 93  | Christian Iván Navarro Cuéllar and Omar Paredes  | Deciphering Schizophrenia and Neurodegenerative Mechanisms through Gene Coexpression Networks Modelling in L2/3 IT Neurons  |
| 94  | Humberto Lopez-Baltierra, Celia M. Quiñonez-Flores, Morayma O. Romo-Garcia, Abimael Guzman-Pando, Luis C. Hinojos-Gallardo, Hugo Varela-Rodríguez, Cesar Lopez-Camarillo and Javier Camarillo-Cisneros | The Role of Bioinformatics and Computational Chemistry in Future Cancer Research  |
| 96  | Jesús Fausto Córdova-Manzo, María Lesvia Escobar-Hernández, Hugo Zepeda-Peralta, Arturo Vera-Hernández, Lorenzo Leija-Salas and Citlalli Jessica Trujillo-Romero                                       | Computational Modeling and Experimental Evaluation of a Novel Cold Thermal Pad with a Refrigerant Circuit: Comparison with the Traditional Method                   |
| 100 | Eduardo Campos-Castillo and Edgar Del Hierro-Gutierrez   | Eye Control and Accessibility in Computers  |

### Signal processing, medical images, BCI systems, Data Science.

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| 14 | Daniela Fernanda Razo Guevara, Israel Román Godínez, Ricardo Antonio Salido Ruiz, Héctor Hugo Alfaro Cortés, Stewart René Santos Arce and Sulema Torres Ramos  | Assessing Changes in Brain Activity through Microstate Analysis in Serious Video Game Training   |
| 15 | Javier Almeida and Izabella Guerrero-Santana   | Automatic Diabetic Retinopathy identification using the Zernike moment decomposition in fundus images  |
| 21 | Mario Sepúlveda-Hernández, Jesús Hernández-Falcón and Karina Mendoza-Angeles   | Automatization of Analysis Behavior in Crayfish  |
| 22 | Josseline Rojas-Martínez, Jesús Hernández-Falcón and Karina Mendoza-Angeles  | Immersive EEG Signal Analysis and Eye Tracking in Decision Making  |
| 29 | Emmanuel Gonzalez-Gutierrez, Jorge Airy Mercado-Gutierrez and Oscar Yanez-Suarez   | An exploration on the use of IMUs for real-time detection of gait events, towards closed-loop gait rehabilitation based on Functional Electrical Stimulation |
| 30 | Mario Orozco Rodríguez, Aurora Espinoza Valdez, Geisa B. Gallardo Moreno, Andrés A. González Garrido, Fabiola R. Gómez Velázquez and Vanessa D. Ruiz Stovel  | Resting-State Functional Connectivity in Patients with Type 1 Diabetes   |
| 37 | Karely Alvarez, Marianna Pacheco, Fabián Cienfuegos Caraveo, Elma Natalia Romero Ramos, Graciela Maria de Jesus Ramirez Alonso and Carlos Eduardo Cañedo Figueroa  | A comparative analysis of the optimization of machine learning in the diagnosis of ocular toxoplasmosis  |
| 40 | Fernando Arambula Cosio, Orlando Castellanos Díaz, Jorge Luis Perez Gonzalez, Raquel Valdes Cristerna, Veronica Medina Bañuelos, Lisbeth Camargo Marin and Mario Guzman Huerta   | Deep Learning Applied to Automatic Fetometry   |
| 41 | Erika Betzabé Mendoza-Camacho, José Raúl Neri Alonso and Francisco J. Alvarez-Padilla  | Segmentation and Automatic Detection of Brain Aneurysms by Computer Vision Tracking System   |
| 44 | Hiram Jesús Higuera Valenzuela, Carlos Ivanhoe Martínez Osorio and José Rafael Benito Noriega Luna   | An Alternative to Conventional Electrodes for Biopotential Acquisition   |
| 46 | Luz Melissa Chávez Diez de Sollano, Alethia Silvana Morán Franco and Alberto Isaac Perez Sanpablo  | Development of a semi-automatic prosthetic hand using visual perception and EMG.   |
| 47 | Isaac Rendon Sanchez, Erik Molino Minero Re, Fernando Arámbula-Cosío, Blanca Vázquez Gómez, Nidiyare Hevia Montiel, Raquel Valdés Cristerna, Orlando Castellanos Díaz, Verónica Medina Bañuelos, Lisbeth Camargo Marín, Mario Guzmán Huerta and Jorge Perez-Gonzalez | Early Birth Weight Prediction: A Machine Learning Explainability Analysis  |
| 54 | María Fernanda Rueda-Calixto, María Daniela Perez-Morales, Jessica Adriana Maldonado-Cerón, Anai Alicia Valencia-Lazcano, Raúl Martínez-Memije, Jennifer del Carmen Escobar-Alvarado and Brayans Becerra-Luna  | Detection of sleep apnea based on ECG recording, pulse, and heart rate variability   |
| 66 | Héctor E. Parga-Nájera, Grecia I Bustos-Mancilla, Luis Jimenez-Angeles, Ingrid S Morales-Sánchez and Jorge L Rojas-Arce  | Analysis of Facial Expressivity in Individuals with Parkinson's Disease through Dynamic Features Extracted from Video Recordings                             |
| 73 | Emma P. Lopez-Anaya, Liliana Granados-Castro, Carlos A. Lopez-Hernandez, Rogelio Salinas-Gutierrez, Aldo Rodrigo Mejia-Rodriguez, Daniel U. Campos-Delgado and Omar Gutierrez-Navarro  | Metric-Based Comparison for Skin Perfusion Pressure Estimation Using Multi-Spectral Imaging and Multi-Wavelength Photoplethysmography                        |
| 87 | Oscar Ivan Liñan-López, Adrian Diamandi Olivares-Romo, Hermes Sebastian Torres-Ortega, Diomar Enrique Rodriguez-Obregón and Aldo Rodrigo Mejia-Rodriguez   | Pulmonary Parenchyma and COVID-19 Lesion Volumetric Segmentation based on Probabilistic Active Contours  |
| 91 | Emiliano Martinez-Reyna, Guadalupe Dorantes Mendez, Araceli Espinosa Guerrero and José Javier Reyes Lagos  | The Impact of Maternal Obesity on Fetal Heart Rate Variability During Labor: A Non-Linear Analysis   |
| 95 | Alejandra Castro-Sánchez, José Javier Reyes-Lagos, Eric Alonso Abarca-Castro, Hugo Mendieta-Zerón, Ana Karen Talavera-Peña and Laura Mercedes Santiago-Fuentes   | Analysis of Maternal-Fetal Heart Rate Coupling in Preeclamptic Women in Labor Using Time-Frequency Coherence   |
| 97 | Francisco Josue Portos Juárez, Adrian Lima Zempoaltecatl, Edgar Antonio Félix García and Andrés Emilio Hurtado Pérez   | Analysis and classification of body muscles during contraction using EMG signals and neural networks   |
| 98 | Herlinda Araiza Lizarde and Daniel Lorias Espinoza   | Analysis of surface electromyographic signals (sEMG) using LabVIEW's Biomedical toolkit  |

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| 102 | Alina Santillan Guzman, Vanessa Guadalupe Urbina Aquino, Jonathan Yahir Flores Pacheco, Angel Carranza Córdoba, Karina Cerezo Huerta and Brenda Trejo Torres | A comparative study of EEG signals from healthy subjects and medicated mental disorder patients while doing a selective attention task |
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## IOT in health, Bioinstrumentation, Biosensors, Bioimpedance and Micro/Nano Technologies, Wearable Systems

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| 33 | Yair Díaz, Pamela Salas, Christian Chapa, José Mejía and Rafael Gonzalez-Landaeta  | Comparative Analysis of Wearable Seismocardiogram Waveform detected with an Accelerometer and a Shielded PVDF Film |
| 50 | Arnoldo Díaz Reyes, Brenda Daniela Cazabal Rodríguez, Alberto Isaac Perez Sanpablo and José Ambrosio Bastián   | Design and Development of Polysomnography Monitor with MQTT Communication Protocol for Web Viewing                 |
| 53 | Joshua A. Romero-Andrade, Estefanía Vazquéz-García, César A. González-Díaz, Jaime E. López-Madrigal, Leticia Arias-González and Virginia Sánchez-Monroy  | Electrical Bioimpedance Spectroscopy System Based on AD5933EBZ to Determine DNA Concentrations                     |
| 71 | Anais Gomez-Rocha, Eider Aparicio-Martinez and Rocio B. Dominguez  | A flexible pH with laser-induced graphene/polyaniline composite for wound monitoring                               |
| 80 | Eduardo Macias-Naranjo, Fernanda Reyes-Jiménez, Wilialdo Pérez, Luis E. Ibarra-Serna, Diana Calles-Sánchez, Karen Dueñas-Álvarez, Erick Guzmán-Quezada, Hugo Velez-Perez and Rebeca Romo-Vazquez | Detection of mental fatigue in movement-related cortical potential   |
| 99 | Carlos Omar González, Héctor Herrera, Rafael Rojas and Valentín Trujillo   | Prototype for Remote Acquisition of Vital Signs Using Internet of Things (IoT) Technologies                        |

## Biomechanics, Rehabilitation, Biomaterials and Tissue Engineering.

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| 3  | Octavio Diaz-Hernandez, Igor Salinas-Sanchez, Alejandra Santos-Borraez, Silvia Vargas-Vidal and Raide A. Gonzalez-Carbonell  | Device for Artificial Proprioception applied to lower limb prosthesis  |
| 9  | Paulina Sánchez-Ramírez, Agustín Vidal-Lesso, Natali Mancera-Campos and Javier Bayod-López   | Numerical assessment of structural behavior of the plantar fascia in Ledderhose, diabetes, and healthy cases   |
| 16 | Oscar Rubiano, Viviana Andrea Orjuela Herrera, Daniel Ricardo Avila and Ruben Dario Hernandez Beleño   | Development of a VR system for stroke patient rehabilitation based on physiological signals  |
| 23 | Luis Felipe Reséndiz Domínguez, Jorge Airy Mercado Gutiérrez, Josefina Gutiérrez Martínez, Marco Antonio Nuñez Gaona and Juan Ramón Jiménez Alaniz   | Results of a Survey Applied to Potential Users of a Functional Electrical Stimulation Device and its Use to Design a User Interface Based on IEC 62366 and IEC 62304 Standards |
| 36 | Ana Pereda-Galicia, Mónica Romero-Chávez, Jimena García-Silva, Marco Mendoza-Gutiérrez and Isela Bonilla-Gutiérrez   | Performance Evaluation of an Experimental Robotic Therapy Protocol Based on Kinematic Metrics  |
| 38 | Adriana Cristina Pliego Carrillo, Yuridi Isabel Colin Cantinca, José Javier Reyes Lagos and Claudia Ivette Ledesma Ramírez   | Stabilometric parameters in pregnant women in first, second, and third trimester   |
| 43 | Elvis Anyel Garcia-Cortes, Julio Cesar Perez-Sansalvador and Teresita Spezzia-Mazzocco   | Comprehensive Optical Characterization and Refractive Index Optimization of Agar-Based Phantoms with Varying Ink and Nanoparticle Concentrations                               |
| 45 | Alan Alejandro Guzman Valladares, Gerardo Alejandro Fumagal González, Pamela Rodríguez Valdez, Arnulfo Alejandro Morales Guzmán, Ricardo Esteban Roberts Ugrinovic and Marcos David Moya Bencomo | IMU usage in Sports Science: Advancements in Biomechanical Assessment for ACL Injuries.  |
| 52 | Omar Alejandro Moo-Huerta, Eliza Miranda-Buendía, Alfredo Maciel-Cerda, Patricia Mendoza-Lorenzo and Roberto Hernández-Córdova   | Morpho-mechanical Analysis of PLA/Fish Gelatin Electrospun Nanofiber Scaffolds for Tissue Engineering  |
| 63 | Héctor A. Landa-Fernández, Mirian C. Campos-Hernández and Pablo S. Luna-Lozano   | Evaluation of Balance During Gait Using the Tinetti Scale  |

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| 64  | Daniela O. Casas-Hernandez, Estefani Hernández-González, Lucero Gómez-Cruz, Kevin M. Díaz-Marín and Pablo S. Luna-Lozano | Balance Detector: a Tool for Measuring Static Balance                                   |
| 101 | Vanessa Villanueva-Susunaga and Edgar Del Hierro-Gutierrez   | Therapeutic game for people with stroke sequelae using Kinect from Xbox 360 to Windows. |

### Clinical Engineering, Regulations and Innovation and Development of Technologies for Health, Medical Physics

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| 1   | Daniel A Manzano-Soto, M Ximena Ruiz-Y-García and Martha R Ortiz-Posadas   | Technovigilance Standardized Operative Procedures for a High Specialty Hospital in Mexico                                 |
| 2   | Lizbeth Guzmán Canizales and Martha R Ortiz-Posadas  | Feasibility Study of Implement a Bariatric Clinic in a High Specialty Regional Hospital in the State of Mexico            |
| 42  | Mariana Brandão, Juliano Martins, Lúcia Nazareth Amante, Luciara Sebold and Renato Garcia  | Interaction between Clinical Engineering and Nursing in Awareness of Metrological Reliability in Medical Devices          |
| 55  | Alejandra Debo Vega, Daniela Silva Moreno, Sergio Camacho Juárez and Bersaín Reyes   | Obtaining the Certification Granted by the General Health Council for a Hemodialysis Unit in Mexico During COVID-19 times |
| 69  | Valdir Ferreira Filho, Saabrina Fernandes Hijazi and Renato Garcia Ojeda   | Prototype of a digital platform for chronic disease management  |
| 72  | Jhoana Olenka Rodriguez Díaz, Isabel Andrea León Luna, Angie Milagros Díaz Torres and Leslie Cieza   | Aurichck: Device that facilitates the diagnosis of possible atrial fibrillation, intended for first level care            |
| 88  | Claudia Zavaleta, Stephany Samaniego, Dante Rodriguez, Sofia Nieto, Angie Núñez, Jamila Vitella, Sebastián Huerta, Joaquín Sánchez, Jesús Gonzáles and Ernesto Isidro                              | Pressure Pro: A wireless medical prototype for integrated blood pressure and pulse oximetry monitoring                    |
| 103 | David Alberto Palomo Torres and Marco Antonio De Román Mello   | Impact study of the master's degree in clinical engineering, in the southeastern region of Mexico                         |
| 105 | Adriana Sarahy Hernández-Puga, Yaisiri M. Hernández-León, Marcela del Carmen Velázquez-Ramos and Juan Carlos Gutiérrez-García  | Ergonomic panty for the relief of pain caused by dysmenorrhea in Mexican women from 18 to 35 years old                    |
| 107 | Lazaro Gael Cortez Moncada, Mariana Elvira Palomares Gonzalez, Karime Cristal Cardona Salazar, Gerardo Adrian De La Rosa Hernandez, Jesus Alberto Morales Gomez and Oscar Eduardo Cervantes Garcia | Technique for Cranioplasty Manufacturing Utilizing Polymethylmethacrylate (PMMA) and Flexible Resin Molds                 |

### National Student Contest on Biomedical Engineering “Dra. Veronica Medina Bañuelos” Undergraduate Finalist

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| 17 | Humberto A. Salinas-Cortes, José M. Martínez-Serrato, Vianney Muñoz-Jiménez and Marco Ramos  | A Machine Learning approach to breast cancer detection in mammograms                          |
| 34 | Roberto Hernández Chávez, Yair Leonardo Grijalva González, Bernardo Octavio Enríquez Guillen, Javier Camarillo Cisneros, Natalia Gabriela Sámano Lira and Abimael Guzmán Pando | Maternal Risk Prediction During Pregnancy Through Machine Learning Using Mexican Women's Data |

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| 75 | Luis Valtierra, Jesus Villavicencio-Navarro, Cynthia B. Perez, Luis A. Castro, Abel Esquer and Mario-Ivan Ramirez  | Design Sprint Methodology for Developing a Mobile App for Real-Time Remote ECG  |
| 57 | Joselinne Alicia Valdez Mendoza, German Hoyos Conteras, América Jollette Ortiz Castillo, Maricruz Rocha Rubio, Jazmín Cristina Stevens Barrón and Christian Chapa González | Synthesis of gold nanoparticles using extracts or biomolecules contained in pecan nut for potential applications in the treatment of acute lymphoblastic leukemia |

### National Student Contest on Biomedical Engineering “Dra. Veronica Medina Bañuelos” Graduate Finalist

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| 84 | Enrique Hernandez-Laredo, Marco Antonio Hernández-Galicia, René Arnulfo García-Hernández and Yulia Ledeneva  | Detecting Confusing Drug Names Based on the Phonetic Characteristics of Mel-Frequency Cepstral Coefficient and Evolutionary Computation |
| 84 | Enrique Hernandez-Laredo, Marco Antonio Hernández-Galicia, René Arnulfo García-Hernández and Yulia Ledeneva  | Detecting Confusing Drug Names Based on the Phonetic Characteristics of Mel-Frequency Cepstral Coefficient and Evolutionary Computation |
| 86 | Marco Antonio Hernández-Galicia, Enrique Hernandez-Laredo, Yulia Ledeneva and René Arnulfo García-Hernández  | Detection of Plant–Disease Relationship Using Long Short-Term Memory Networks   |
| 7  | María Fernanda López-Arámburo, Stewart René Santos-Arce, Natanael Hernández-Vázquez, Ricardo A Salido-Ruiz, Sulema Torres-Ramos and Israel Román-Godínez | Statistical and Texture Features to Characterize DILD Radiological Findings   |
| 13 | Daniela Suárez-Hernández, Stewart R. Santos-Arce, Sulema Torres-Ramos, Ricardo A. Salido-Ruiz and Israel Román-Godínez                                   | Amyotrophic Lateral Sclerosis Detection using Facial Symmetry Analysis with Machine Learning Techniques                                 |
| 82 | Evelin Ramírez-Ponce, Oscar Ramos-Quezada, Eduardo Macias-Naranjo, Alioth Guerrero-Aranda, Hugo Vélez-Pérez and Rebeca Romo-Vázquez                      | Comparison of Entropy Values in EEG of Patients with Juvenile Myoclonic Epilepsy and Healthy Individuals                                |