2023 11th International Conference in Software Engineering Research and Innovation (CONISOFT 2023)

Leon, Guanajuato, Mexico
6 – 10 November 2023

IEEE Catalog Number: CFP23B19-POD
ISBN: 979-8-3503-2884-4

Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number: CFP23B19-POD
ISBN (Print-On-Demand): 979-8-3503-2884-4
ISBN (Online): 979-8-3503-2883-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

2023 11th International Conference in Software Engineering Research and Innovation (CONISOFT)

CONISOFT 2023

Table of Contents

Preface ..... **x**
Organizing Committee ..... **xii**
Local Committee ..... **xiii**
Program Committee ..... **xiv**
Technical Committee ..... **xv**
Reviewers ..... **xvi**
Sponsors ..... **xix**

Core Themes of Software Engineering

Ensemble Classifiers in Software Defect Prediction: A Systematic Literature Review 1
Johann A. Olivares-Galindo (Universidad Veracruzana, México), Ángel J. Sánchez-García (Universidad Veracruzana, México), R. Erandi Barrientos-Martínez (Universidad Veracruzana, México), and Jorge Octavio Ocharán-Hernández (Universidad Veracruzana, México)

An Approach of a Migration Process from a Legacy Web Management System with a Monolithic Architecture to a Modern Microservices-Based Architecture of a Tourism Services Company 9
Blanca A. Pinos-Figueroa (Universidad Politécnica Salesiana, Ecuador) and Gabriel A. León-Paredes (Universidad Politécnica Salesiana, Ecuador)

On the Formal Verification of Smart Contracts 18
René Dávila (UNAM, Ciudad Universitaria, México), Rocio Aldeco-Perez (UNAM, Ciudad Universitaria, México), and Everardo Bárcenas (UNAM, Ciudad Universitaria, México)

Domain-Driven Design for Microservices Architecture Systems Development: A Systematic Mapping Study 25
Josué Sangabriel-Alarcón (Universidad Veracruzana, México), Jorge Octavio Ocharán-Hernández (Universidad Veracruzana, México), Karen Cortés-Verdín (Universidad Veracruzana, México), and Xavier Limón (Universidad Veracruzana, México)

Functional Programming Oriented Software Design: A Systematic Literature Review 35
José Daniel Camarillo-Villa (Universidad Veracruzana, México), Xavier Limón (Universidad Veracruzana, México), Karen Cortés-Verdín (Universidad Veracruzana, México), and Ángel J. Sánchez-García (Universidad Veracruzana, México)

Software Methodologies and Practices

Benefits and Challenges of the Behavior-Driven Development: A Systematic Literature Review..... 45
Víctor Manuel Arredondo-Reyes (Universidad Veracruzana, México), Saúl Domínguez-Isidro (Universidad Veracruzana, México), Ángel J. Sánchez-García (Universidad Veracruzana, México), and Jorge Octavio Ocharán-Hernández (Universidad Veracruzana, México)

Q-Story: An Ontology-Based on Quality of User Stories in Scrum. a Quantitative Assessment 55
Claudia Tona (Universidad Autónoma de Baja California, México), Reyes Juárez-Ramírez (Universidad Autónoma de Baja California, México), Samantha Jiménez (Universidad Autónoma de Baja California, México), and Fernanda Murillo-Muñoz (Universidad Autónoma de Baja California, México)

Requirements Traceability Tools and Issues in Very Small Entities: A Systematic Literature Review and a Tool Proposal 65
Jair Nájera-Salaices (Centro de Investigación en Matemáticas – Unidad Zacatecas, México), Mirna Muñoz (Centro de Investigación en Matemáticas – Unidad Zacatecas, México), and Jezreel Mejía (Centro de Investigación en Matemáticas – Unidad Zacatecas, México)

Empirical Software Engineering

A Comparative Analysis of Hard and Soft Skills Required by Software Development Companies in Ecuador 75
Kevin Chévez-Coronel (Escuela Superior Politécnica del Litoral, ESPOL, Ecuador), Rodrigo Saraguro-Bravo (Escuela Superior Politécnica del Litoral, ESPOL, Ecuador), Margarita Mawyin-Koriakova (Escuela Superior Politécnica del Litoral, ESPOL, Ecuador), Pamela Rugel-Diaz (Escuela Superior Politécnica del Litoral, ESPOL, Ecuador), and José Jaramillo-Saltos (Escuela Superior Politécnica del Litoral, ESPOL, Ecuador)

Security Testing for web Applications: A Systematic Literature Review 82
Antonio de Jesús Domínguez-García (Universidad Veracruzana, México), Xavier Limón (Universidad Veracruzana, México), Jorge Octavio Ocharán-Hernández (Universidad Veracruzana, México), and Juan Carlos Pérez-Arriaga (Universidad Veracruzana, México)

Beyond Chunking: Re-Engineering Password Segmentation for Better Honeywords 92
Satya Sannihith Lingutla (Ontario Tech University, Canada), Meher Viswanath Nety (Ontario Tech University, Canada), and Miguel Vargas Martin (Ontario Tech University, Canada)

How Password Strength Becomes a Weak Link for Honeywords 99
Meaghen Vydelingum (Ontario Tech University, Canada) and Miguel Vargas Martin (Ontario Tech University, Canada)

Applying Mechanisms of Data Profiling for Assuring Data Quality in the Software: A First Approach 108
César Guerra-García (Autonomous University of San Luis Potosí), Héctor G. Pérez-González (Autonomous University of San Luis Potosí), Francisco Martínez-Pérez (Autonomous University of San Luis Potosí), Reyes Juárez-Ramírez (Autonomous University of Baja California), and Samantha Jiménez (Autonomous Univeristy of Baja California)

Software Engineering Education (SEE)

Application of Learning Analytics in Higher Education Institutions: A Systematic Literature Review 116
Ángel Salas Martínez (Universidad Veracruzana, México) and Alberto Ramírez Martinell (Universidad Veracruzana, México)

Exploratory Study in Student's Perception in the Use of ChatGPT 124
Mauricio Y. Chávez (Universidad Autónoma de Baja California, México), Fernanda Ugalde G. (Universidad Autónoma de Baja California, México), Mario Aguilar (Universidad Autónoma de Baja California, México), Samantha Jiménez (Universidad Autónoma de Baja California, México), David A. Mejia-Medina (Universidad Autónoma de Baja California, México), and Reyes Juárez-Ramírez (Universidad Autónoma de Baja California, México)

Web Systems for the Development of Computational Thinking in Software Engineering Students: A Systematic Literature Review 132
Daniel Pale-Parra (Universidad Veracruzana, México), Christian Pérez-Salazar (Universidad Veracruzana, México), Ángel J. Sánchez-García (Universidad Veracruzana, México), and Jorge Octavio Ocharán-Hernández (Universidad Veracruzana, México)

Interaction with Other Disciplines Close Related to Software Engineering

Serious Game Prototype Based on Strategies for Children with Autism Spectrum Disorder: Learning with "TEA" 140
Sodel Vazquez Reyes (Autonomous University of Zacatecas, México), Metzli Viridiana Gutierrez Villalobos (Autonomous University of Zacatecas, México), Carlos E. Galván Tejada (Autonomous University of Zacatecas, México), Perla Velasco-Elizondo (Autonomous University of Zacatecas, México), Alejandra García Hernández (Autonomous University of Zacatecas, México), and Alejandro Mauricio González (Autonomous University of Zacatecas, México)

Protecting Users' Identity Against Browser Fingerprinting 150
Prem Shingote (National College of Ireland, Ireland), Vanessa Ayala-Rivera (National College of Ireland, Ireland), and A. Omar Portillo-Dominguez (Technological University Dublin, Ireland)

Detection of Phishing in Mobile Instant Messaging Using Natural Language Processing and Machine Learning 159
Suman Verma (National College of Ireland, Ireland), Vanessa Ayala-Rivera (National College of Ireland, Ireland), and A. Omar Portillo-Dominguez (Technological University Dublin, Ireland)

Factors Affecting the Results of Gesture Elicitation: A Review 169
Yuting Cheng (Shanghai Jiao Tong University, China), Zhanwei Wu (Shanghai Jiao Tong University, China), and Ruowei Xiao (Southern University of Science and Technology, China)

Academic Achievement in Mathematics of Higher-Middle Education Students in Veracruz: An Approach Based on Computational Intelligence 177
Yaimara Céspedes-González (Universidad Veracruzana, Mexico), Alma Delia Otero Escobar (Universidad Veracruzana, Mexico), Jerónimo Domingo Ricárdez Jiménez (Universidad Veracruzana, Mexico), and Guillermo Molero-Castillo (Universidad Nacional Autónoma de México, Mexico)

A Systematic Mapping Study on Accessibility in Data Visualizations for Visually Impaired Users 186
Luis R. Tlapa-Monge (Universidad Veracruzana, México) and Luis G. Montané-Jiménez (Universidad Veracruzana, México)

Denoising of Digital Speech Audio in Amplitude Modulated Radio Signals with the D4 and D6 Wavelet Filters 197
Mario Jiménez Hernández (Instituto Politécnico Nacional, México)

Towards a Collaborative Tool to Support User-Centered Design 205
Sofía Isabel Fernández Gregorio (Universidad Veracruzana, México), Gerardelli Santiago Cruz (Universidad Veracruzana, México), Leonardo Saul Galicia Meza (Universidad Veracruzana, México), Jans Perez Quintero (Universidad Veracruzana, México), and Carmen Mezura-Godoy (Universidad Veracruzana, México)

Adaptation of a 3D Geographic Information System on the Web (3D Webgis) for the Visualization of Buildings, Objects, and Navigation Routes on the Campus Barcelona of the Universidad De Los Llanos 213
Jonatan Quintero Gamez (GITECX & AdaLab, Universidad de los Llanos Villavicencio, Colombia), Cesar Augusto Diaz Celis (GITECX & AdaLab, Universidad de los Llanos Villavicencio, Colombia), and Angel Cruz-Roa (GITECX & AdaLab, Universidad de los Llanos Villavicencio, Colombia)

Trends in Software Engineering

Complexity and Similarity Analysis of ChatGPT-Generated Text 220
Gael H. Durán (Universidad Autónoma de Baja California, México), Rafael Chávez (Universidad Autónoma de Baja California, México), Rosemberg Estrada (Universidad Autónoma de Baja California, México), Camilo Caraveo Mena (Universidad Autónoma de Baja California, México), Leticia Cervantes Huerta (Universidad Autónoma de Baja California, México), and Alan Ramírez-Noriega (Universidad Autónoma de Sinaloa, México)

Smart System for Optimization Resources at Home: A Proposal for Savings and Sustainability 229
Leandro Espino Espino (EspinoLeandroo), Edgar Gonzalo Cossio Franco (Instituto de Información Estadística y Geográfica), Yotziri Paloma Pérez Rios (EspinoLeandroo), and Ramón A. Briseño (Universidad De Guadalajara, Centro Universitario de Ciencias Económico Administrativas, Doctorado en Tecnologías de Información)

Class Balancing Approaches in Dataset for Software Defect Prediction: A Systematic Literature Review 236
Dan Javier Olvera-Villeda (Universidad Veracruzana, México), Ángel J. Sánchez-García (Universidad Veracruzana, México), Xavier Limón (Universidad Veracruzana, México), and Saúl Domínguez Isidro (Universidad Veracruzana, México)

A Satisfiability Algorithm for Multi-Modal Logic with Converse 246
Diego Medina-Martínez (National Autonomous University of Mexico, México), Everardo Bárcenas (National Autonomous University of Mexico, México), Rocío Aldeco-Pérez (National Autonomous University of Mexico, México), Guillermo Molero-Castillo (National Autonomous University of Mexico, México), and Alejandro Velázquez-Mena (National Autonomous University of Mexico, México)

Conceptual Modeling of the V Gene Annotation Process in Antibodies 256
Noemi Serret (Tecnológico Nacional de México/CENIDET, México), Javier Ortiz-Hernandez (Tecnológico Nacional de México/CENIDET, México), Juan Miguel-Ruiz (Tecnológico Nacional de México/CENIDET, México), Jesús Martínez Barnetche (Instituto Nacional de Salud Pública, México), and Yasmin Hernández (Tecnológico Nacional de México/CENIDET, México)

Creation of Time Series Models Based on Deep Learning for Generation of Probabilistic Forecasts Using GluonTS and Python. 265
Karina Cancino-Villatoro (Universidad Politécnica de Tapachula, México), Alfredo Castillo Solís (Universidad Politécnica de Tapachula, México), Christian Castillo-Estrada (Universidad Autónoma de Chiapas, México), and Reyes Juárez-Ramírez (Universidad Autónoma de Baja California, México)

Program Synthesis and Natural Language Processing: A Systematic Literature Review 275
Rolando Ramírez-Rueda (Universidad Veracruzana, México), Edgard Benítez-Guerrero (Universidad Veracruzana, México), Carmen Mezura-Godoy (Universidad Veracruzana, México), and Everardo Bárcenas (Universidad Nacional Autónoma de México, México)

Author Index **283**