

2016 IEEE Colombian Conference on Communications and Computing (COLCOM 2016)

**Cartagena, Colombia
27-29 April 2016**



**IEEE Catalog Number: CFP1652S-POD
ISBN: 978-1-5090-1085-1**

**Copyright © 2016 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 publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

| | |
|-------------------------|-------------------|
| IEEE Catalog Number: | CFP1652S-POD |
| ISBN (Print-On-Demand): | 978-1-5090-1085-1 |
| ISBN (Online): | 978-1-5090-1084-4 |

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

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

| | |
|---|-----|
| CHANNEL CAPACITY ANALYSIS OF 2D BARCODES: QR CODE AND CQR CODE-5 | 1 |
| <i>M. Melgar, L. Santander</i> | |
| COMPARATIVE ANALYSIS OF AUTOMATED CLASSIFIERS APPLIED TO VOLCANO EVENT IDENTIFICATION | 6 |
| <i>R. Lara-Cueva, E. Carrera, J. Morejon, D. Benitez</i> | |
| ON THE USE OF THE EMOTIV EPOC NEUROHEADSET AS A LOW COST ALTERNATIVE FOR EEG SIGNAL ACQUISITION | 12 |
| <i>D. Benitez, S. Toscano, A. Silva</i> | |
| A LOW COST BAROPODOMETRIC SYSTEM FOR CHILDREN’S POSTURAL AND GAIT ANALYSIS | 18 |
| <i>F. Pineda-Lopez, A. Guerra, E. Montes, D. Benitez</i> | |
| COOPERATIVE SELF-ORGANIZED OPTIMAL POWER CONTROL FOR INTERFERENCE MITIGATION IN FEMTOCELL NETWORKS | 22 |
| <i>A. Sanchez, J. Arauz, Z. Miller</i> | |
| UMTS/HSPA AND LTE CELLULAR SYSTEMS: ON THE FREQUENCY BANDS AND THE BIT ERROR RATE | 28 |
| <i>N. Orozco, H. Carvajal, G. Olmedo, R. Leon, C. Almeida</i> | |
| A NEW PROPAGATION MODEL IN WIMAX-BASED WIRELESS FIXED NETWORKS | 34 |
| <i>R. Lara-Cueva, D. Aguilar, P. Leon, D. Almeida, D. Benitez</i> | |
| MACHINE LEARNING CLASSIFIERS FOR ANDROID MALWARE ANALYSIS | 39 |
| <i>C. Lopez, A. Cadavid</i> | |
| PERFORMANCE AND OPTIMIZATION OF WIDE AREA WIRELESS LINKS USING DEDICATED HARDWARE | 45 |
| <i>D. Aguilar, P. Leon, R. Lara, G. Santos</i> | |
| SIMULACIÓN Y COMPROBACIÓN DE COBERTURA Y COMPATIBILIDAD ELECTROMAGNÉTICA DE OPERADORAS DE TRANSMISIÓN DE TELEVISIÓN DIGITAL PARA LA CIUDAD DE QUITO | 51 |
| <i>D. Aguilar, P. Leon, J. Parreno, N. Espinosa, J. Alvarez, M. Garcia</i> | |
| PROTOTIPO DE CHALECO CON COMPUTACIÓN PORTÁTIL PARA SEGURIDAD VIAL | 57 |
| <i>P. Leon, A. Davila, D. Aguilar, B. Torres</i> | |
| USING TERRESTRIAL RADIO LINKS TO MULTILATERATION TECHNIQUES | 63 |
| <i>C. Morales, D. Guevara, M. Truyol</i> | |
| OPTIMIZATION MODEL TO DETERMINE THE RELAY STATIONS LOCATION INTO 4G CELLULAR NETWORKS | 69 |
| <i>L. Ruiz-Gomez, M. Bravo, C. Lozano-Garzon, Y. Donoso</i> | |
| HYBRID METHODOLOGIES FOR MODAL PARAMETERS EXTRACTION FOR STRUCTURAL HEALTH MONITORING | 75 |
| <i>S. Villamizar-Delgado, J. Ramirez-Cortes, A. De Stefano, P. Ascamilia-Ambrosio, M. Pulido-Navarro, J. Ortiz-Aguilar</i> | |
| QUEUE OCCUPATION - BASED RED WITH ADAPTIVE CONTROL FOR TELEMEDICINE TRAFFIC | 81 |
| <i>F. Berrio, N. Gomez</i> | |
| DESIGN AND IMPLEMENTATION OF WIRELESS SENSOR NODE IN 900MHZ AND 2.4GHZ BANDS | 87 |
| <i>M. Gonzalez, G. Puerto, C. Echeverry, C. Suarez</i> | |
| OPTIMAL DEPLOYMENT OF RSU FOR EFFICIENT COMMUNICATIONS MULTI-HOP FROM VEHICLE TO INFRASTRUCTURE ON VANET | 92 |
| <i>R. Cumbal, H. Palacios, R. Hincapie</i> | |
| LDPC-DWDM PROCESSING FOR OPTICAL COMMUNICATIONS USING POLYMER FIBER | 98 |
| <i>L. Torres, A. Ortega</i> | |
| PATH LOSS MODEL FOR INDOOR PARKING ENVIRONMENTS IN A WIRELESS SENSOR NETWORK | 103 |
| <i>C. Ruiz-Zea, C. Osorno, M. Vallejo</i> | |
| ANTI-THEFT SYSTEM AND TEMPERATURE CONTROL OF COMPUTER EQUIPMENT FOR LABORATORIES AND DATA CENTER OF THET FACULTY OF ELECTRICAL AND COMPUTING ENGINEERING | 108 |
| <i>I. Valeriano, H. Pichardo, M. Chalen, W. Velasquez</i> | |

| | |
|---|-----|
| SOFTWARE DEFINED NETWORKING FOR ELECTRICAL SUBSTATIONS BASED ON IEC 61850 | 113 |
| <i>C. Vargas, C. Carmona-Rodriguez</i> | |
| QOS ON WIRELESS SENSOR NETWORK APPLIED IN POST-SEISMIC ASSESSMENT | 119 |
| <i>M. Huerta, R. Gonzalez, A. Perez, R. Clotet, K. Villarroel, D. Rivas, Y. Hernandez</i> | |
| METHOD TO FINGERPRINT MATCHING IN THE ENCRYPTED DOMAIN | 125 |
| <i>R. Fernandez, Y. Heredia, V. Senti, A. Cento</i> | |
| WIRELESS SYSTEM FOR SUPPORTING HOME HEALTH CARE OF CHRONIC DISEASE PATIENTS | 131 |
| <i>J. Arboleda, J. Aedo, F. Rivera</i> | |
| ON ACHIEVING ENERGY EFFICIENT MINIMUM DELAY PATHS IN SOFTWARE DEFINED NETWORKS | 136 |
| <i>E. Montoya, J. Botero</i> | |
| ALGORITHM FOR UNDERWATER SWIMMER TRACKING USING THE HSV COLOR MODEL AND COMPRESSIVE SENSING | 142 |
| <i>C. Reyes, E. Mojica, C. Correa, H. Arguello</i> | |
| COMUNICACIÓN MACHINE-TO-MACHINE PARA SISTEMAS INTELIGENTES DE TRANSPORTE | 147 |
| <i>Y. Quintero, A. Salazar, G. Patino</i> | |
| A PROTOCOL DEVELOPMENT FOR WIRELESS POWER TRANSFER OVER AD HOC NETWORKS | 153 |
| <i>H. Jimenez, J. Lopez, J. Trivino</i> | |
| MAINTENANCE SCHEDULING FOR A POWER SYSTEM OPERATING ASSETS USING PETRI NETS INTEGRATION WITH ANT COLONY OPTIMIZATION | 159 |
| <i>H. Florez-Celis, C. Ruiz-Zea, G. Zapata-Madrigal, L. Martinez-Giraldo</i> | |
| NEW APPROACH TO ENERGY MANAGEMENT SYSTEM FOR HOME BASED ON OPEN SOURCE AND HARDWARE | 165 |
| <i>R. Alvarez-Lopez</i> | |
| EVALUATION OF PROTOTYPING TOOLS BASED ON CATEGORIES AND PARAMETERS | 169 |
| <i>J. Banchon, M. Villavicencio, E. Izquierdo</i> | |
| GOOD: GENETIC ORDERING OF DOCUMENTS | 175 |
| <i>A. Velastegui, W. Pinheiro, M. Peixoto</i> | |
| SOCIAL RESPONSIBILITY IN THE COLOMBIAN CONTEXT: TELECOMMUNICATIONS AS AN ENGINEERING TOOL AND SOLUTION FOR A SCHOOL OF THE MUNICIPALITY OF CHIVATA, BOYACA | 181 |
| <i>A. Gaviria, A. Avendano, N. Vergara-Santa, Y. Lopez-Tolosa, L. Herrera-Quintero</i> | |
| AN IOT-BASED OPEN PLATFORM FOR MONITORING NON-IONIZING RADIATION LEVELS IN COLOMBIA | 188 |
| <i>F. Vega, J. Pantoja, S. Morales, O. Urbano, A. Arevalo, E. Muskus, C. Pedraza, M. Patino, M. Suarez, N. Hernandez</i> | |
| Author Index | |