

2017 Systems and Information Engineering Design Symposium (SIEDS 2017)

**Charlottesville, Virginia, USA
28 April 2017**



**IEEE Catalog Number: CFP17SIE-POD
ISBN: 978-1-5386-1849-3**

**Copyright © 2017 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:	CFP17SIE-POD
ISBN (Print-On-Demand):	978-1-5386-1849-3
ISBN (Online):	978-1-5386-1848-6

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

Title	Authors	Page number in proceedings
<i>Wearable Sensors for Analyzing Personal Exposure to Air Pollution</i>	Nghi Dam; Andy Ricketts; Benjamin Catlett; Justin Henriques	1
<i>Assessment of Moringa-Functionalized Carbon Based Biofilter for Disinfection Through Column Experiments</i>	John Raymond Barajas; Sheree Pagsuyoin	5
<i>Design of a Marine Debris Removal System</i>	Morgan Yang; Thomas Chrissley; Connor Maloy; Anthony Mason	10
<i>Alcoholic Fermentation of Rice Hulls Hydrolyzed by Rumen Fluid Obtained from Slaughterhouse Wastes</i>	Kelvin Maglipon; Kenn Madridano; Jefferson Araojo; John Raymond Barajas	16
<i>Zero Carbon Dioxide National Electric Production Strategy and Cost Estimate</i>	Gabriel McGinness; Camilo Torrez; Ryan Rosenmeier; Iulian Gugiu	20
<i>Robotic Assistant for Mobility-Impaired Patients (RAMP)</i>	Pwint Htwe; Alex Wong; Karar Majeed; Hanan Al Jarash	26
<i>Wind Data Collection Techniques on a Multi-Rotor Platform</i>	Carl A Wolf; Richard P Hardis; Steven D Woodrum; Richard S Galan; Hunter S Wichelt; Michael C Metzger; Nicola Bezzo; Gregory C Lewin; Stephan F.J. deWekker	32
<i>AirChat: Ad Hoc Network Monitoring with Drones</i>	Luke P Morrison; Brian Team; Brian Nguyen; Senthil Kannan; Nathan Ray; Gregory C Lewin	38
<i>Design of a Laboratory Electric Vehicle Powertrain System</i>	Kevin Benecki; Robert Prins	44
<i>A Framework for Building Type-Safe Configurations for JVM Using Code Generation Techniques</i>	Hussachai Puripunpinyo; M. H. Samadzadeh	50
<i>Design of an Improved Model for Marine Species Movement</i>	Andrew Fernandez; Christopher Ludwig; Raul Ayllon; Jay Daniel Gusman	56
<i>Design and Analysis of A Storm Surge Protection System for Reagan National Airport</i>	Mohammad Haji; Naif Alwaji; Daij Aldakhil; Mohamud Diriye	62
<i>Design of an Enhanced Defect Identification System for Commercial Building Construction</i>	Ju Yeon Park; James Lange; Okan Koc; Firas Bakhat	67
<i>Design of a New Decision Support System for Missing Aircraft</i>	Raymond Skaddan; Majed Zaini; Noura Alhashemi; Mohanad Khuraishi	73
<i>Design of a Cruise Control System Prototype for the GT500's Airplane</i>	Leonardo Ospina	79
<i>Redefining the Food Component of U.S. Foreign Policy</i>	Steven Agness; Catherine Aichholz; Ambareesh Gorle; Casey Russell; Newton Quantz, IV; Witold Turkiewicz; Garrick Louis	84
<i>Designing User Experiences for Policymakers in Serious Games in the Domain of Global Food Security</i>	Blake Anderson; Sara Coulter; Rachel Orłowsky; Blake Ruzich; Rachel Smedley; Michael Purvis; Gerard Learmonth, Sr.; Gregory Gerling	89
<i>Cultural Understanding for the Development of an American-Chinese Cross-Cultural Simulator</i>	Jacob Bishop; William Lopez; Pearl Brooks; John Brown	95
<i>Application of Machine Learning Methodologies to Multiyear Forecasts of Video Subscribers</i>	Jordan Baker; Andrew Pomykalski; Kaley Hanrahan; Gianluca Guadagni	100
<i>Customer Churn Analysis for a Software-as-a-service Company</i>	Yizhe Ge; Shan He; Jingyue Xiong; Donald E Brown	106

Title	Authors	Page number in proceedings
<i>Adversarial Learning in Credit Card Fraud Detection</i>	Mary Frances Zeager; Aksheetha Sridhar; Nathan Fogal; Stephen Adams; Donald Brown; Peter Beling	112
<i>Horse Race Analysis in Credit Card Fraud—Deep Learning, Logistic Regression, and Gradient Boosted Tree</i>	Gabriel Rushin; Cody Stancil; Muyang Sun; Peter Beling; Stephen Adams	117
<i>Comparing Unsupervised Learning Approaches to Detect Network Intrusion Using NetFlow Data</i>	Julina Zhang; Kerry Jones; Tianye Song; Hyojung Kang; Donald Brown	122
<i>Development of Performance Metrics for Automated Evaluation of Surgeons' Performance Under Simulation-Based Training</i>	Ellie Kayton; Marisa McCarthy; Abigail Holbrook; Nicole Fabian; Albert Chang; Monica Ennis; Inki Kim	128
<i>Localization of Health Center Assets Through an IoT Environment (LoCATE)</i>	Travis McAllister; Samy S. El-Tawab; M. Hossain Heydari	132
<i>CloudConnect: Evaluating the Use of Precision Medicine in Treatment of Type 1 Diabetes</i>	Benjamin Matthews; Brendan Rogers; Cameron Moore; Emily Lewis; James Kim; Jonathan Bae; John Corbett; Stephen Patek	138
<i>Healthcare Analytics and Visualization Using SEMantic Open Source Software (SEMOSS)</i>	Claire Baker; Jeannie Blackwood; Casey Hartless; Jeanne Pirro; Abigail Flower	144
<i>Evidence-Based Decision Support for Managing the Mentally Ill Inmate Population</i>	Michela Nardi; Carter Levinson; Meredith Lawrence; Audrey Kamauff; James Wilby; William Burge	150
<i>System Design of a Knee Motion Sensor to Prevent ACL Injuries</i>	Taban Yazdani; Tony Petro; Salima Sekandari; Anas Alharbi	156
<i>Design of a Drone Light Show Production System</i>	Alexander Lanteigne; Elias Kibru; Sabreena Azam; Suliman Alshammary	162
<i>Implementation of a Recruit Visualization Tool for UVA Football</i>	Leah Walter; Andrew Citera; Kenyon Knowles; Matthew Lowen; Cole Oldenburg; Haitham Shahin; William Scherer; Chris Tuttle	168
<i>Smart Automated Water Sprinkler (SAWS): Residential Irrigation by Boundary Mapping and Variable Water Pressure Control</i>	Leonard Blado; Louie Decena, Jr; Tyler Hall; Michael LaBounty; Michael Shaughnessy; Siripong Potisuk	174
<i>Identification of Flight Maneuvers and Aircraft Types Utilizing Unsupervised Learning with Big Data</i>	Zachary Blanks; Alyssa Sedgwick; Brenden Bone; Andrew Mayerchak	180
<i>Monitoring Brain Waves in an Effort to Investigate Student's Cognitive Load During a Variety of Problem Solving Scenarios</i>	Blaize Majdic; Elise Barrella; Olga Pierrakos; Charles Cowan, II; Justyn Girdner; Winifred Opoku	186
<i>Using TOEFL Sub-Scores to Predict SPEAK Test Outcome: A Multivariate Bayesian Model</i>	Veronica Mercado	192
<i>Investigating the Relationship Between Traffic Incidents and Public Events: A Case Study</i>	Chase Grimm; Andre Fristo; Mostafa Amin-Naseri; Mingyi Hong; Anuj Sharma	198
<i>Implementing Data Analytics for U.Va. Football</i>	Harry Elkins; Austin Beane; Jake Cherkes; William Clougherty; Joseph Krohn; Henry Sellars; William Scherer; James Valeiras	202
<i>Analysis of Identity and Access Management Alternatives for a Multinational Information-sharing Environment</i>	Zachary Calhoun; Leah Procopi; Patrick Maribojoc; Edward Selzer; Cody Fleming; Nicola Bezzo	208
<i>Colorado Springs Hotel Market Compression Detection Tool</i>	George Provost; William McEntee; Andrew Gikas; Troy St. Peter	214

Title	Authors	Page number in proceedings
<i>Proposed Process for Rapidly Customizable Widgets for Online News Articles</i>	Amani Farooque; Katie Hall; Hunter Davlin; Tim McKinney; Sigmundur Helgason; Naveed Bazazan; Reid Bailey	219
<i>Using Image Data for Quality Assurance in Additive Manufacturing</i>	Victoria Forbes; José Alvarez Jr.; Raad Califa; Samuel Ezersky; Guny A Lucana Quiroz; Kevin Zeng; Gregory C Lewin	225
<i>Priorities in Hospital Care Across Varying Socioeconomic Demographics</i>	Stephen Morris; Yixin Yang; Abigail Flower	231
<i>Improving Analysis and Reporting for Virginia's Division of Consolidated Laboratory Services Newborn Screening Program</i>	Chris Patrick; Hampton Leonard; Wendy Novicoff; Rhonda West; Christen Crews; Wanda "Willie" Andrews	237
<i>Using Abrupt Change Detection to Categorize Glucose Variability of Type 1 Diabetes Patients</i>	Lev Zadvinskiy; Christian Wheeler; Gregory Gardner; Abigail Flower	243
<i>Gene Set Creation Algorithm for Microarray Studies with Low Sample Size</i>	Erik Langenborg; Kevin Sun; Lingfeng Cao; Christopher Overall; Abigail Flower	248
<i>Predicting Patient Revisits at the University of Virginia Health System Emergency Department</i>	Brady Fowler; Monica Rajendiran; Timothy Schroeder; Nicholas Bergh; Abigail Flower; Hyojung Kang	253
<i>A Systems Approach to Improving Patient Flow at UVA Cancer Center Using Real-Time Locating System</i>	Anna Ewing; Jordan Rogus; Prathibha Chintagunta; Logan Kraus; Morgan Sabol; Hyojung Kang	259
<i>Multi-task Cox Proportional Hazard Model for Predicting Risk of Unplanned Hospital Readmission</i>	Megan Grzyb; Amber Zhang; Cristina Good; Khaled Khalil; Bochen Guo; Lu Tian; Jose Valdez; Quanquan Gu	265
<i>Using Patient-Generated Health Data to Facilitate Preoperative Decision Making for Breast Cancer Patients</i>	Brendan Abraham; Daniel Duong; Morgan George; Margaret Greene; Jack Kepley; Kaleigh Rosenberg; Matthew Gerber; Laura E Barnes	271
<i>Medical Sterilization System for NASA Space Exploration Missions</i>	Zachary Duda; John Gaffney II; Christopher Graves; Quinlan Moore; James Watkins; Jacquelyn Nagel	277
<i>A Behavioral Sensing System That Promotes Positive Lifestyle Changes and Improves Metabolic Control Among Adults with Type 2 Diabetes</i>	Bobby Alexander; Kaan Karakas; Colleen Kohout; Hakan Sakarya; Nipun Singh; Justin Stachtiaris; Laura E Barnes; Matthew Gerber	283
<i>The SIMPLE Methodology for Developing and Evaluating Cross-Cultural Virtual Training Systems</i>	Hannah Woodruff; Jasmine Jella; Christopher Bayer; Hannah Murdoch; Robert Matts; Aman Kapoor; Brian An; Donald Brown; Stephanie Guerlain	289
<i>Redistributing the Pressure of Prosthetic Systems</i>	Blaize Majdic; Danielle Wilson; Thomas Barrett; Heather McLeod; Elise Barrella	294
<i>Home Automation and Personalization Through Individual Location Determination</i>	Hattie Clougherty; Alec Brown; Margaret Stonerock; Michael Trepte; Matthew Whitesell; Reid Bailey	300
<i>Automated Lighting System for Park Pathways</i>	Rachel Dunning; Jasbir Harnal; Bradley Barrett; Sinan Yucesan; Benjamin Browning; Thomas Harrison; Gregory C Lewin	306
<i>Deployment of Advanced Bidirectional Chargers to Lower Total Cost of Ownership of Electric-Vehicle Fleets</i>	Joseph C. Sweeney; Matthew C. Ledwith; Daniel S. Costello; Jessica S. Lin; David N. Brown; Timothy R. Leimbach; Mackenzie P. Gotsch; John Wheeler; Colin J. Steers; David Slutzky; James H. Lambert	312

Title	Authors	Page number in proceedings
<i>Design of a Workflow Optimization System for Urban Water Utility Maintenance</i>	Adnan Khan; Rebekah Orozco; Mohamed Khattab; Fahad Alqahtani	318
<i>Residential Wind Turbine Design Decision Support System</i>	James Fritz; Luis Soto; Anutaj Chahal; Mohammed Almutairi	324
<i>Design of a Decision Support System to Reduce Net Radiative Forcing via Optimal Contrail Generation</i>	Caroline Abramson; Faie Almofeez; John Carroll; Chris Margopoulos	330
<i>A Multi-objective Genetic Algorithm to Solve the U-Shaped Line Balancing Problem Using Random Weights</i>	Celia M Cruz-Valencia; Ulises Martinez-Contreras; Humberto Hajar-Rivera; Mirella Parada-González; Ma Ramirez-Ambriz	336
<i>Socio-Temporal Trends in Urban Cultural Subpopulations Through Social Media</i>	Lander Basterra; Tyler Worthington; James Rogol; Donald Brown	341
<i>Joint Sentiment Models for Event Detection and Latent Cultural Structure Assessment in Nationalist Text</i>	Colin Cassidy; Thomas Molinari; Fandi Lin; Rafael Alvarado; Ke Wang	347
<i>Mixed Linear Modeling Techniques for Predicting Fatalities in Vehicle Crashes</i>	Lulu Ge; Tyler Hutcherson; Qi Tang; Quanquan Gu	353
<i>Computational Analysis of Religious and Ideological Linguistic Behavior</i>	Seth Green; Megan Stiles; Katherine Harton; Samantha Garofalo	359
<i>Building a Research Assistant Management Platform Utilizing Natural Language Processing</i>	Nicolas Kim; Matthew DaVolio; Joel Stein; Rafael Alvarado	365
<i>A Framework for Visualizing Research Data</i>	Genevieve Burgoyne; Mark Rooney	371