

2016 IEEE MIT Undergraduate Research Technology Conference (URTC 2016)

**Cambridge, Massachusetts, USA
4-6 November 2016**



**IEEE Catalog Number: CFP16E50-POD
ISBN: 978-1-5090-3877-0**

**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 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:	CFP16E50-POD
ISBN (Print-On-Demand):	978-1-5090-3877-0
ISBN (Online):	978-1-5090-3876-3

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

STRATEGIC REPORTING IN EXPONENTIAL FAMILY PREDICTION MARKETS	1
<i>Zheyuan Shi ; Sindhu Kutty</i>	
WIRELESS INFRASTRUCTURE ENHANCES ON BODY HEALTH MONITORING SYSTEMS.....	5
<i>Sarah Lam</i>	
SIMULATION MODEL ON CHAOTIC ASYNCHRONOUS TRANSMITTER AND RECEIVER	7
<i>Yilan Zhu ; Andrew Fish</i>	
SMARTPHONE ENABLED TELEREHABILITATIVE WEARABLE GLOVE FOR STROKE PATIENTS	10
<i>Guihui Liu</i>	
AN INTERACTIVE FACIAL-EXPRESSION TRAINING PLATFORM FOR INDIVIDUALS WITH AUTISM SPECTRUM DISORDER	13
<i>Christina Tsangouri ; Wei Li ; Zhigang Zhu ; Farnaz Abtahi ; Tony Ro</i>	
STRESSAWARE: AN APP FOR REAL-TIME STRESS MONITORING ON THE AMULET WEARABLE PLATFORM	17
<i>George Boateng ; David Kotz</i>	
A TEST BED FOR DETECTING AND MIMICKING FINGER JOINT BENDING.....	21
<i>Dan Lin</i>	
COMPLIANT LEG DESIGNS FOR ATTENUATING IMPACT OF AIRDROP LANDING OF QUADRUPED ROBOTS	24
<i>Yeeho Song ; Dirk Martin Luchtenburg</i>	
WORKLOAD CHARACTERIZATION OF THE SHARED/BUY-IN COMPUTING CLUSTER AT BOSTON UNIVERSITY.....	29
<i>Yonatan Klausner ; Christopher Liao ; David Starobinski ; Eran Simhon ; Azer Bestavros</i>	
A GENERALIZED SOLUTION TO THE COVERAGE PROBLEM IN SWARM ROBOTICS: THE FORCE VECTOR ALGORITHM.....	33
<i>Alberto Rivera</i>	
VEIN DETECTION USING VEIN TRANSILLUMINATION AND CONTRAST DIFFERENTIATION FOR PRACTITIONER AID	37
<i>Sarah K. Agnalt ; Drew M. Canfield ; Kristi M. Perreault ; Joseph D. Legris ; Benjamin D. McPheron</i>	
ESTIMATION OF CLUSTER CENTROIDS IN PRESENCE OF NOISY OBSERVATIONS	41
<i>Khaled Kamal Saab</i>	
EXPERIMENTAL VALIDATION OF DIFFUSION COEFFICIENT IDENTIFICATION USING A MULTI-ROBOT SYSTEM.....	45
<i>Mingchen Li ; Kun Su ; Yufei Zhang ; Jie You ; Wencen Wu</i>	
DEVELOPMENT OF LOW COST DEVICE FOR IN-SITU ALGAE MONITORING	49
<i>Aidan J Bradley ; Wesley C. Caruso ; Yi Zheng ; Charles V. Thangaraj ; Benjamin D. McPheron</i>	
SMART E-TEXTILE GLOVES FOR QUANTIFIED MEASUREMENTS IN MOVEMENT DISORDERS.....	52
<i>Lauren Plant ; Berly Noriega ; Arjun Sonti ; Nicholas Constant ; Kunal Mankodiya</i>	
SMARTWATCH-DRIVEN MULTISENSORY RECORDER: DESIGN AND TESTING OF A SMARTWATCH-BASED FRAMEWORK TO SUPPORT PSYCHIATRIC DISORDERS.....	56
<i>Matthew Constant ; Leslie Brick ; Nicole Nugent ; Michael Armev ; Kunal Mankodiya</i>	
A SCALABLE MODULAR HETEROGENEOUS SYSTEM FOR HOME AND OFFICE AUTOMATION.....	60
<i>Fredy Augusto Maciel Alves ; Charles Thangaraj</i>	
THERMAL ENERGY HARVESTING FOR SELF-POWERED SMART HOME SENSORS	64
<i>Maxwell Yun ; Ecenur Ustun ; Phillip Nadeau ; Anantha Chandrakasan</i>	
HEALTHVISOR: A LOOK INTO DATA-RICH BIO-MONITORING	68
<i>Brian Goldwyn ; Andrew Pastore ; James Spencer ; Weihui Li ; Chen-Hsiang Yu</i>	
DRIVE FIELD FILTER DESIGN FOR MAGNETIC PARTICLE IMAGING (MPI) APPARATUS.....	72
<i>Suma Anand ; Clarissa Zimmerman Cooley ; Larry Wald</i>	
SYNCHROTRON IMAGING OF INTACT HONEYBEES AFFECTED BY NOSEMA.....	75
<i>Katarina Stevanovic ; Pierre Giovenazzo ; Mark Adam Webb</i>	
PERSONALIZING A SLEEP HEALTH APP FOR COLLEGE STUDENTS USING PERSONALITY TRAITS AND CHRONOTYPE	79
<i>Holly Nguyen</i>	

NON-NEGATIVE MATRIX FACTORIZATION TEST CASES.....	83
<i>Connor Sell ; Jeremy Kepner</i>	
PERFORMANCE OF A HIGHLY CONFIGURABLE CHANNEL EMULATOR.....	87
<i>Blake Hewgill ; James Jamison</i>	
SMART ADAPTIVE BOOT FOR ANKLE INSTABILITY TREATMENT	91
<i>Zi Wang ; Howard Burpee ; Hamza Tiridi ; Justin Gagne ; Greg Frasco ; Rabeeh Majidi ; Chen-Hsiang Yu ; Ali Kiapour</i>	
MULTI-COMMUNICATION TYPE DEBUGGING PROBE	95
<i>Somtochukwu Okwuosah ; Austin Funes ; Cheng Guo ; Fatemeh Tehranipoor ; John Chandy</i>	
LUNG CANCER TISSUE SAMPLES DISCRIMINATION THROUGH STATISTICAL ANALYSIS OF POLARIMETRIC ANGULAR-RESOLVED DIFFUSE MEASUREMENTS	99
<i>Joseph B. Majeski ; Kevin J. Lynch ; George C. Giakos</i>	
LIGHTWEIGHT MALWARE DETECTION BASED ON MACHINE LEARNING ALGORITHMS AND THE ANDROID MANIFEST FILE	103
<i>Monica Kumaran ; Wenjia Li</i>	
AN INDOOR POSITIONING SYSTEM FACILITATED BY COMPUTER VISION	106
<i>Avi Cooper ; Poojit Hegde</i>	
HURRICANE EVACUATION TRAFFIC MODEL	111
<i>Anisha Nakagawa ; Ira Winder</i>	
EFFICIENTLY COMPUTING PIECEWISE FLAT EMBEDDINGS FOR DATA CLUSTERING AND IMAGE SEGMENTATION	115
<i>Renee T. Meinhold ; Tyler L. Hayes ; Nathan D. Cahill</i>	
Author Index	