

2019 International Conference on Advancements in Computing (ICAC 2019)

**Malabe, Sri Lanka
5 – 6 December 2019**



**IEEE Catalog Number: CFP19V93-POD
ISBN: 978-1-7281-4171-8**

**Copyright © 2019 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:	CFP19V93-POD
ISBN (Print-On-Demand):	978-1-7281-4171-8
ISBN (Online):	978-1-7281-4170-1

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

TECHNICAL PROGRAM COMMITTEE	N/A
ORGANIZING COMMITTEE	N/A
MESSAGE FROM THE GENERAL CHAIR	N/A
KEYNOTE SPEECH I	N/A
KEYNOTE SPEECH II	N/A
WORKSHOPS AND TUTORIALS	N/A
CONFERENCE SCHEDULE	N/A
TECHNICAL SESSIONS	N/A
TABLE OF CONTENTS	N/A
ABSTRACTS OF TECHNICAL SESSION I	N/A
Artificial Intelligence (AI-1) (5th December 2019)	N/A
Analyzing Payment Behaviors and Introducing an Optimal Credit Limit	N/A
AI Based Depression and Suicide Prevention System	N/A
Intelligent Flood Management System	N/A
Intelligent Timetable Scheduler: A Comparison of Genetic, Graph Coloring, Heuristic and Iterated Local Search Algorithm	N/A
Cyber Security (CS-1) (5th December 2019)	N/A
FIMAA: Four-way Integrated Mobile Authentication API	N/A
Security Platform for Mobile OS	N/A
An Automated Tool for Memory Forensics	N/A
Enhanced Secure Solution for POS Architecture	N/A
Mobile Computing (MC-1) (5th December 2019)	N/A
A Mobile App for Location Based Customer Notifications about Sales Offers	N/A
Online Music Platform to Create Interaction between Music Artists and Fans	N/A
Zero Food Waste (Food Wastage Sustaining Mobile Application)	N/A
TOURGURU- Tour Guide Mobile Application for Tourists	N/A

Health Informatics (HI-1) (5th December 2019)	N/A
Therapy Tool for Adolescents with ADHD	N/A
DiabiTech- Non-Invasive Blood Glucose Monitoring System	N/A
Wedaduru - An Intelligent Ayurvedic Disease Screening and Remedy Analysis Solution	N/A
A Gamified Approach for Screening and Intervention of Dyslexia, Dysgraphia and Dyscalculia	N/A
Dots Witer: Prediction of Potential Cancer Driver Genes using Hybrid Approach	N/A
Software Engineering (SE-1) (5th December 2019)	N/A
Cloud Native Efficient Solution for API Migration across Environments for Agile Integration Enterprises	N/A
gCodex: A Tool to Analyze Software Repositories Overtime (Visualization)	N/A
MOOCs Recommender Based on User Preference, Learning Styles, and Forum Activity	N/A
Code Vulnerability Identification and Code Improvement using Advanced Machine Learning	N/A
Data Science and Data Mining (DS-1) (5th December 2019)	N/A
Stock Market Prediction using Machine Learning Techniques	N/A
Crowd-sourced Approach to Generate Real-time Passenger Train Timetable	N/A
Predictive Analytics Platform for Organic Cultivation Management	N/A
Forecast Municipal Solid Waste Generation in Sri Lanka	N/A
ABSTRACTS OF TECHNICAL SESSION II	N/A
Natural Language Processing (NLP-1) (5th December 2019)	N/A
Ayurvedic Knowledge Sharing Platform with Sinhala Virtual Assistant	N/A
Recognition and Translation of Ancient Brahmi Letters using Deep Learning and NLP	N/A
Responsive Drone Autopilot System for Uncertain Natural Language Commands	N/A
Robotics and Automation (RA-1) (5th December 2019)	N/A
Smart Mirror with Virtual Twin	N/A
Design and Implementation of an Autonomous Indoor Surveillance Robot Based on Raspberry Pi	N/A

Smart Wheelchair to Facilitate Disabled Individuals	N/A
Computer Vision (CV-1) (5th December 2019)	N/A
Easy Learning: Augmented Reality Based Environmental Studies for Primary Students	N/A
Localization of the Optic Disc using Red and Green Channels of the Retinal Images	N/A
Zilla - An Animal Based Social Media Platform	N/A
Assistive Technologies (AT-1) (5th December 2019)	N/A
Tool to Extract and Summarize Methodologies of Research Articles for Visually Impaired Researchers	N/A
Document Reader for Vision Impaired Elementary School Children to Identify Printed Images	N/A
Automated Smart Checkup Portal Network System to Check the Vision and Hearing of the Patients	N/A
ICT for Development (ICT-1) (5th December 2019)	N/A
Film-it: Virtual Location Scout and Movie Production Planning Assistant for Film Industry in Sri Lanka	N/A
Plus Go: Intelligent Complementary Ride-Sharing System	N/A
Drown Prevention and Flood prediction using smart embedded devices	N/A
ABSTRACTS OF TECHNICAL SESSION III	N/A
Artificial Intelligence (AI-2) (6th December 2019)	N/A
Using CNNs RNNs and Machine Learning Algorithms for Real-time Crime Prediction	N/A
On the Effectiveness of using Machine Learning and Gaussian Plume Model for Plant Disease Dispersion Prediction and Simulation	N/A
Traffic Density Estimation and Traffic Control using Convolutional Neural Network	N/A
Comparative Analysis of the Application of Deep Learning Techniques for Forex Rate Prediction	N/A
Machine Learning approaches for Emotion Classification of Music: A Systematic Literature Review	N/A
Cyber Security (CS-2) (6th December 2019)	N/A
Intelligent SOC Chatbot for Security Operation Center	N/A
Comprehensive Forensic Data Extraction and Representation System for Windows Registry	N/A
Mobile-Based Malware Detection and Classification Using Ensemble Artificial Intelligence	N/A

Web-application Security Evaluation as a Service with Cloud Native Environment Support	N/A
AI Based Cyber Threats and Vulnerability Detection Prevention and Prediction System	N/A
Adaptive Authentication Service for any Identity Server	N/A
Internet of Things (IoT-1) (6th December 2019)	N/A
Automated Attendance Monitoring System using IoT	N/A
Smart Water Buddy: IoT Based Intelligent Domestic Water Management System	N/A
RFID Based Theft Detection System for Automobile Parts	N/A
IoT Device to Detect Anemia: A Non-Invasive Approach with Multiple Inputs	N/A
SmartOne: IoT-Based Smart Platform to Manage Personal Water Usage	N/A
Air Quality Monitoring and Analysis Based Predictive System; Air Visio	N/A
Health Informatics (HI-2) (6th December 2019)	N/A
Dia-Shoe: A Smart Diabetic Shoe to Monitor and Prevent Diabetic Foot Ulcers	N/A
EMR Sri Lanka - Electronic Medical Records in Sri Lanka	N/A
A Mobile Application using Artificial Intelligence Expert to Predict and Manage High Blood Pressure and Provide Personalized Recommendations to Lower It	N/A
iPillow: Sleep Quality Improvement System	N/A
Computer Networks and Communication (CN-1) (6th December 2019)	N/A
Smart Platform for Cloud Service Providers	N/A
Multi-cloud Container Communication using Software Defined Network	N/A
Efficient Agricultural Sensor Network with Disease Detection	N/A
Secure Web Navigation with Intrusion Detection and Quota Management for SOHO and Small-Scale Businesses	N/A
VAULT - A Shared Distributed and Redundant Storage Solution	N/A
Data Science and Data Mining (DS-1) (6th December 2019)	N/A
Identification of Best Teaching Practice by VAK Model in the Computer Degree Programme	N/A

VTutor: A Platform for Improving Searchability and Interactivity of Recorded Lectures	N/A
MOOCRec 2 for Humanities - Learning Style Based MOOC Recommender and Search Engine	N/A
Optimization of Customer-Friendly Manual Load Shedding System	N/A
Deep Learning Based Flood Prediction and Relief Optimization	N/A
Smart Crop and Fertilizer Prediction System	N/A

PROCEEDINGS OF TECHNICAL SESSION I

Artificial Intelligence (AI-1) (5th December 2019)	68
Analyzing Payment Behaviors and Introducing an Optimal Credit Limit	68
AI Based Depression and Suicide Prevention System	73
Intelligent Flood Management System	79
Intelligent Timetable Scheduler: A Comparison of Genetic, Graph Coloring, Heuristic and Iterated Local Search Algorithm	85
Cyber Security (CS-1) (5th December 2019)	91
FIMAA: Four-way Integrated Mobile Authentication API	91
Security Platform for Mobile OS	97
An Automated Tool for Memory Forensics	103
Enhanced Secure Solution for POS Architecture	109
Mobile Computing (MC-1) (5th December 2019)	116
A Mobile App for Location Based Customer Notifications about Sales Offers	116
Online Music Platform to Create Interaction between Music Artists and Fans	122
Zero Food Waste (Food Wastage Sustaining Mobile Application)	129
TOURGURU- Tour Guide Mobile Application for Tourists	133
Health Informatics (HI-1) (5th December 2019)	139
Therapy Tool for Adolescents with ADHD	139
DiabiTech- Non-Invasive Blood Glucose Monitoring System	145
Wedaduru - An Intelligent Ayurvedic Disease Screening and Remedy Analysis Solution	151

A Gamified Approach for Screening and Intervention of Dyslexia, Dysgraphia and Dyscalculia	156
Dots Witer: Prediction of Potential Cancer Driver Genes using Hybrid Approach	162
Software Engineering (SE-1) (5th December 2019)	168
Cloud Native Efficient Solution for API Migration across Environments for Agile Integration Enterprises	168
gCodex: A Tool to Analyze Software Repositories Overtime (Visualization)	174
MOOCs Recommender Based on User Preference, Learning Styles, and Forum Activity	180
Code Vulnerability Identification and Code Improvement using Advanced Machine Learning	186
 Data Science and Data Mining (DS-1) (5th December 2019)	 192
Stock Market Prediction using Machine Learning Techniques	192
Crowd-sourced Approach to Generate Real-time Passenger Train Timetable	198
Predictive Analytics Platform for Organic Cultivation Management	204
Forecast Municipal Solid Waste Generation in Sri Lanka	210
Identification of Best Teaching Practice by VAK Model in the Computer Degree Programme	216
 PROCEEDINGS OF TECHNICAL SESSION II	
Natural Language Processing (NLP-1) (5th December 2019)	220
Ayurvedic Knowledge Sharing Platform with Sinhala Virtual Assistant	220
Recognition and Translation of Ancient Brahmi Letters using Deep Learning and NLP	226
Responsive Drone Autopilot System for Uncertain Natural Language Commands	232
Robotics and Automation (RA-1) (5th December 2019)	238
Smart Mirror with Virtual Twin	238
Design and Implementation of an Autonomous Indoor Surveillance Robot Based on Raspberry Pi	244
Smart Wheelchair to Facilitate Disabled Individuals	249

Computer Vision (CV-1) (5th December 2019)	255
Easy Learning: Augmented Reality Based Environmental Studies for Primary Students	255
Localization of the Optic Disc using Red and Green Channels of the Retinal Images	261
Zilla - An Animal Based Social Media Platform	267
 Assistive Technologies (AT-1) (5th December 2019)	 273
Tool to Extract and Summarize Methodologies of Research Articles for Visually Impaired Researchers	273
Document Reader for Vision Impaired Elementary School Children to Identify Printed Images	279
Automated Smart Checkup Portal Network System to Check the Vision and Hearing of the Patients	285
 ICT for Development (ICT-1) (5th December 2019)	 291
Film-it: Virtual Location Scout and Movie Production Planning Assistant for Film Industry in Sri Lanka	291
Plus Go: Intelligent Complementary Ride-Sharing System	297
Drown Prevention and Flood prediction using smart embedded devices	304
 PROCEEDINGS OF TECHNICAL SESSION III	 310
 Artificial Intelligence (AI-2) (6th December 2019)	 310
Using CNNs RNNs and Machine Learning Algorithms for Real-time Crime Prediction	310
On the Effectiveness of using Machine Learning and Gaussian Plume Model for Plant Disease Dispersion Prediction and Simulation	317
Traffic Density Estimation and Traffic Control using Convolutional Neural Network	323
Comparative Analysis of the Application of Deep Learning Techniques for Forex Rate Prediction	329
Machine Learning approaches for Emotion Classification of Music: A Systematic Literature Review	334

Cyber Security (CS-2) (6th December 2019)	340
Intelligent SOC Chatbot for Security Operation Center	340
Comprehensive Forensic Data Extraction and Representation System for Windows Registry	346
Mobile-Based Malware Detection and Classification Using Ensemble Artificial Intelligence	351
Web-application Security Evaluation as a Service with Cloud Native Environment Support	357
AI Based Cyber Threats and Vulnerability Detection Prevention and Prediction System	363
Adaptive Authentication Service for any Identity Server	369
 Internet of Things (IoT-1) (6th December 2019)	 376
Automated Attendance Monitoring System using IoT	376
Smart Water Buddy: IoT Based Intelligent Domestic Water Management System	380
RFID Based Theft Detection System for Automobile Parts	386
IoT Device to Detect Anemia: A Non-Invasive Approach with Multiple Inputs	392
SmartOne: IoT-Based Smart Platform to Manage Personal Water Usage	398
Air Quality Monitoring and Analysis Based Predictive System; Air Visio	404
 Health Informatics (HI-2) (6th December 2019)	 410
Dia-Shoe: A Smart Diabetic Shoe to Monitor and Prevent Diabetic Foot Ulcers	410
Emergency Patient Identification System	416
A Mobile Application using Artificial Intelligence Expert to Predict and Manage High Blood Pressure and Provide Personalized Recommendations to Lower It	422
iPillow: Sleep Quality Improvement System	427
 Computer Networks and Communication (CN-1) (6th December 2019)	 434
Smart Platform for Cloud Service Providers	434
Multi-cloud Container Communication using Software Defined Network	440
Efficient Agricultural Sensor Network with Disease Detection	446

Secure Web Navigation with Intrusion Detection and Quota Management for SOHO and Small-Scale Businesses	452
VAULT - A Shared Distributed and Redundant Storage Solution	458
Data Science and Data Mining (DS-1) (6th December 2019)	464
VTutor: A Platform for Improving Searchability and Interactivity of Recorded Lectures	464
MOOCRec 2 for Humanities - Learning Style Based MOOC Recommender and Search Engine	470
Optimization of Customer-Friendly Manual Load Shedding System	476
Deep Learning Based Flood Prediction and Relief Optimization	481
Smart Crop and Fertilizer Prediction System	487
Author Index	493