

# MERCon 2018

## Conference Programme

Last Updated May 29, 2018

Day 1	Conference		
May 30	Track 1	Track 2	Track 3
8:00am - 8:30am	Registration		
8:30am - 10:00am	Session W.1.1 - Civil and Environmental Engineering I	Session W.1.2 - Biomedical Engineering and Mechatronics	Session W.1.3 - Chemical and Process Engineering
10:00am - 10:30am	ERU Symposium Poster Session and Tea		
10:30am - 12:30pm	Inauguration and Keynotes: <ul style="list-style-type: none"> <li>• Future Directions of Human Assist Robot Systems by Prof. Kazuo Kiguchi</li> <li>• Spectrum Situational Awareness (SSA) with Autonomous Cognitive Radios by Prof. Sudharman K. Jayaweera</li> </ul>		
12:30pm - 1:30pm	Lunch (on your own)		
1:30pm - 3:15pm	Session W.2.1 - Civil and Environmental Engineering II	Session W.2.2 - Robotics and Control I	Session W.2.3 - Energy and Environmental Engineering and Mechanical Engineering Systems
3:15pm - 3:45pm	ERU Symposium Poster Session and Tea		
3:45pm - 5:30pm	Session W.3.1 - Transport and Logistics I	Session W.3.2 - Robotics and control II and Engineering Mathematics and Statistics	Power Systems, Electrical Machines and High Voltage Engineering I
7:00pm - 8:30pm	Banquet* (for registered Authors, Students, and Invitees)		

\* Golden Rose Hotel, Boralesgamuwa. Shuttle leaves campus at 6:00pm. Meet at Library steps.

Day 2	Conference		
May 31	Track 1	Track 2	Track 3
8:30am - 9:00am	Registration		
9:00am - 13:00am	Session T.1.1 - Civil and Environmental Engineering III	Session T.2.2 - Materials Science and Engineering II	Session T.2.3 - Software Engineering I
10:30am - 11:00am	ERU Symposium Poster Session and Tea		
11:00am - 12:30pm	Session T.2.1 - Civil and Environmental Engineering IV	Session T.2.2 - Materials Science and Engineering II	Session T.2.3 - Software Engineering I
12:30pm - 1:30pm	Lunch (on your own)		
1:30pm - 3:00pm	Inauguration and Keynotes: <ul style="list-style-type: none"><li>• Role of High-Level Technologies in Sustainable Energy Sector Development by Dr. Priyantha Wijayatunga</li><li>• New Trends in Supply Chain and Operations Management by Dr. Sandun Perera</li></ul>		
3:00pm - 3:30pm	ERU Symposium Poster Session and Tea		
3:30pm - 5:15pm	Session T.3.1 - Transport and Logistics II and Technology Management	Session T.3.2 - Materials Science and Textile Engineering	Session T.3.3 - Software Engineering II, and Power Systems, Electrical Machines and High Voltage Engineering II
5:15pm - 5:45pm	Awards Ceremony		
Workshops			
8:30am - 9:00am	Registration		
9:00am - 12:00pm	Hack your Thoughts: Key Aspects of Brain-Computer-Interfacing		
12:00pm - 1:00pm	Lunch (provided)		
1:00pm - 4:00pm	Hack your Thoughts: Key Aspects of Brain-Computer-Interfacing		

Day 3	Workshops				
June 1	Track 1	Track 2	Track 3	Track 4	Track 5
8:30am - 9:00am	Registration				
9:00am - 12:00pm	Workshop on Role of Scanning Electron Microscopy in Modern Material Characterization	Electromagnetic Compatibility Solutions and Passive Components	Workshop on Mechatronics & Micro-Mechatronics	Workshop on Process Control and Real-Time Optimization	Workshop on Applications of Deep Learning
12:00pm - 1:00pm	Lunch (provided)				
1:00pm - 1:30pm	Workshop on Role of Scanning Electron Microscopy in Modern Material Characterization	Electromagnetic Compatibility Solutions and Passive Components			
1:30pm - 4:00pm			Workshop on Photovoltaic Power Conversion Systems: Current Trends	Workshop on Waste Water Treatment Fundamentals, Plant Monitoring, and Operations	
4:00pm - 4:30pm					

# Session Topics

## **May 30 Wednesday**

### **Session W.1.1 - Civil and Environmental Engineering I**

- W.1.1-1 [ 08:30 ] - Total Quality Management Implementation in Sri Lankan Construction Industry A Study of Small and Medium Sized Enterprises
- W.1.1-2 [ 08:45 ] - Embodied Carbon and Cost Analysis to Identify the Most Appropriate Wall Materials for Buildings: Whole Life Cycle Approach
- W.1.1-3 [ 09:00 ] - Beyond Site Material Handling and Transportation in Large-Scale Construction Projects
- W.1.1-4 [ 09:15 ] - A Study on Natural Rain Surface Erosion of Different Walling Materials in Tropics
- W.1.1-5 [ 09:30 ] - Modelling of Corrosion Induced Cover Cracking in Concrete with Exposed Reinforcement
- W.1.1-6 [ 09:45 ] - Current Practices of Sustainable Procurement in the Sri Lankan Construction Industry

### **Session W.1.2 - Biomedical Engineering and Mechatronics**

- W.1.2-1 [ 08:30 ] - Non-Invasive Blood Glucose Monitoring Using a Hybrid Technique
- W.1.2-2 [ 08:45 ] - Development and Characterization of a Soft Tactile Sensor Array Used for Parallel Grippers
- W.1.2-3 [ 09:00 ] - Design and Simulation of MEMS Based Piezoresistive Pressure Sensor for Microfluidic Applications
- W.1.2-4 [ 09:15 ] - Development of a Low-cost Automated Micro Dispense Digital Goniometric Device with Drop Shape Analysis
- W.1.2-5 [ 09:30 ] - An In-depth Study of SSVEP Signals Against Stimulus Frequency and Distance to the Stimulus

### **Session W.1.3 - Chemical and Process Engineering**

- W.1.3-1 [ 08:30 ] - Dangers of Component Trapping in Distillation: An Industrial Methanol Distillation Case Study
- W.1.3-2 [ 08:45 ] - Numerical Simulation of Suspension Biomass Combustor with Two Chambers
- W.1.3-3 [ 09:00 ] - Decolourization of Reactive Red EXF Dye by Isolated Strain *Proteus Mirabilis*
- W.1.3-4 [ 09:15 ] - Powdered Corn Grain and Cornflour on Properties of Natural Rubber Latex Vulcanizates: Effect of Filler Loading
- W.1.3-5 [ 09:30 ] - A Mathematical Model to Predict the Microalgal Growth in an Open Pond Cultivation
- W.1.3-6 [ 09:45 ] - Investigation of the Efficiency of Dairy Wastewater Treatment Using Lipid-Degrading Bacterial Strains

### **Session W.2.1 - Civil and Environmental Engineering II**

- W.2.1-1 [ 13:30 ] - Optimization of Thermal Comfort in Sri Lankan Residential Buildings
- W.2.1-2 [ 13:45 ] - A New Approach to Predict the Porosity of Pervious Concrete at Its Fresh State
- W.2.1-3 [ 14:00 ] - 3D Full-Field Deformation Measuring Technique with Optics-Based Measurements

- W.2.1-4 [ 14:15 ] - Use of Bottom Ash from Coal Fired Thermal Power Plants in Production of Cellular Lightweight Concrete
- W.2.1-5 [ 14:30 ] - Effect of Fly Ash on Self-healing of Cracks in Concrete
- W.2.1-6 [ 14:45 ] - Predicting Wind Response of Tall Buildings Using Fluid-Structure Interaction

#### **Session W.2.2 - Robotics and Control I**

- W.2.2-1 [ 13:30 ] - Simulation of Online Human Arm Inertia Estimation for Robot-aided Rehabilitation
- W.2.2-2 [ 13:45 ] - Development of a Quad-rotor Fixed-wing Hybrid Unmanned Aerial Vehicle
- W.2.2-3 [ 14:00 ] - Feasibility Study of a Novel Cross Assembled Multi-quadrotor Unmanned Aerial Vehicle
- W.2.2-4 [ 14:15 ] - Point Cloud Based Autonomous Area Exploration Algorithm
- W.2.2-5 [ 14:30 ] - Design and Development of a Smart Wheelchair with Multiple Control Interfaces
- W.2.2-6 [ 14:45 ] - Design and Development of an Interactive Service Robot as a Conversational Companion for Elderly People
- W.2.2-7 [ 15:00 ] - Sinhala Speech Recognition for Interactive Voice Response Systems Accessed Through Mobile Phones

#### **Session W.2.3 - Energy and Environmental Engineering and Mechanical Engineering Systems**

- W.2.3-1 [ 13:30 ] - Financial Contracting for Hydro Generators in a Water Market
- W.2.3-2 [ 13:45 ] - Technical, Environmental and Economic Feasibility of Introducing Added Storage to Run of River Mini Hydro Plants to Improve Dispatchability
- W.2.3-3 [ 14:00 ] - C-JAE: 3 DOF Robotic Ankle Exoskeleton with Compatible Joint Axes
- W.2.3-4 [ 14:15 ] - An Investigation of Thickness Variance During Compliant Parts Storage
- W.2.3-5 [ 14:30 ] - An Improved Fixturing Solution for Holding Complex Shaped Components

#### **Session W.3.1 - Transport and Logistics I**

- W.3.1-1 [ 15:45 ] - Topological Structure of the Road Traffic Network in the Western Regional Megapolis, Sri Lanka
- W.3.1-2 [ 16:00 ] - Development of Driving Cycles for Galle
- W.3.1-3 [ 16:15 ] - Analysis on Centrality Index of Air Network
- W.3.1-4 [ 16:30 ] - Analysis of Impediments Hindering FMCG Companies from Rail Freight Distribution in Sri Lanka
- W.3.1-5 [ 16:45 ] - Assessing Impact of Concessionaires on Sea Ports
- W.3.1-6 [ 17:00 ] - Evaluation of Regulatory Gap in UAS Operations in Sri Lanka

### **Session W.3.2 - Robotics and control II and Engineering Mathematics and Statistics**

- W.3.2-1 [ 15:45 ] - GPS Integrated Inertial Navigation System Using Interactive Multiple Model Extended Kalman Filtering
- W.3.2-2 [ 16:00 ] - Development of a PID Based Closed Loop Controller for Shape Memory Alloy Actuators
- W.3.2-3 [ 16:15 ] - Fuzzy-Bot: A Food Serving Robot as a Teaching and Learning Platform for Fuzzy Logic
- W.3.2-4 [ 16:30 ] - Detection of Defects on Warp-knit Fabric Surfaces Using Self Organizing Map
- W.3.2-5 [ 16:45 ] - Impact Analysis of US Dollar Index Volatility on Imports and Import Categories of Sri Lanka
- W.3.2-6 [ 17:00 ] - Effects of Non-Homogeneous Learning on the Performance of Serial Production Systems - A Simulation Study

### **Session W.3.3 - Power Systems, Electrical Machines and High Voltage Engineering I**

- W.3.3-1 [ 15:45 ] - Novel Three Phase Transformer Model to Accommodate the Effects of Load Injected DC
- W.3.3-2 [ 16:00 ] - Assessment of Cost of Unserved Energy for Sri Lankan Commercial Sector
- W.3.3-3 [ 16:15 ] - AC-DC Multi-port Domestic Distribution Interface
- W.3.3-4 [ 16:30 ] - Modified Phase Shifting of Leakage Current to Condition Monitoring of Metal Oxide Surge Arresters in Power System
- W.3.3-5 [ 16:45 ] - Impact of High Penetration of EV Charging on Harmonics in Distribution Networks
- W.3.3-6 [ 17:00 ] - Autonomous Transmission Line Inspection and Fault Detection System

## **May 31 Thursday**

### **Session T.1.1 - Civil and Environmental Engineering III**

- T.1.1-1 [ 09:00 ] - Development of Geopolymer with Coal Fired Boiler Ash
- T.1.1-2 [ 09:15 ] - Daily and Monthly Lumped Parameter Hydrologic Models for Analysis of Small Watersheds in Sri Lanka
- T.1.1-3 [ 09:30 ] - Predicting Fretting Fatigue Crack Propagation Using Finite Element Analysis
- T.1.1-4 [ 09:45 ] - A Case Study on the Retention Tanks in the Walawe Ganga River Basin, Sri Lanka
- T.1.1-5 [ 10:00 ] - Development of an Earth Pressure Cell to Evaluate the Total and Effective Stresses of Soil
- T.1.1-6 [ 10:15 ] - Load Slip Behaviour of Bolted Timber Joints Made of "Hora" Timber Species

### **Session T.1.2 - Materials Science and Engineering I**

- T.1.2-1 [ 09:00 ] - Novel Thermogravimetry Based Analytical Method for Cellulose Yield Prediction of Sri Lankan Rice Straw Varieties
- T.1.2-2 [ 09:15 ] - Development of a Vibration Energy Harvesting Device Using Piezoelectric Sensors
- T.1.2-3 [ 09:30 ] - Computational Modeling of Perovskite Structured Methylammonium Lead Iodide as a Solar Absorber
- T.1.2-4 [ 09:45 ] - Determination of Thermal Conductivity of LDPE Using Dual Hot Wire Probe Method
- T.1.2-5 [ 10:00 ] - Evaluation of the Suitability of 1 4-Dimethylpiperazine as a Substitute Catalyst in Polyurethane Foam Production
- T.1.2-6 [ 10:15 ] - Study of Thermal and Mechanical Properties of Microcrystalline Cellulose and Nanocrystalline Cellulose Based Thermoplastic Material

### **Session T.1.3 - Big Data, Machine Learning, and Cloud Computing**

- T.1.3-1 [ 09:00 ] - Distinguishing Real Web Crawlers from Fakes: Googlebot Example
- T.1.3-2 [ 09:15 ] - Evaluation of Different Classifiers for Sinhala POS Tagging
- T.1.3-3 [ 09:30 ] - Unit Conflict Resolution for Automatic Math Word Problem Solving
- T.1.3-4 [ 09:45 ] - Transliteration and Byte Pair Encoding to Improve Tamil to Sinhala Neural Machine Translation
- T.1.3-5 [ 10:00 ] - Clustering Sinhala News Articles Using Corpus-Based Similarity Measures
- T.1.3-6 [ 10:15 ] - Integration of Bilingual Lists for Domain-Specific Statistical Machine Translation for Sinhala-Tamil

### **Session T.2.1 - Civil and Environmental Engineering IV**

- T.2.1-1 [ 11:00 ] - A Tool to Assess Construction Worker Productivity
- T.2.1-2 [ 11:15 ] - Fly Ash-based Geopolymer Mud Concrete Block

- T.2.1-3 [ 11:30 ] - Fired-Siltstone Based Geopolymers for CO2 Sequestration Wells
- T.2.1-4 [ 11:45 ] - Identify the Differences of AC Load Requirement with Respect to the Floor Number in High Rise Buildings
- T.2.1-5 [ 12:00 ] - A Proximity Based Rehabilitation Approach for Abandoned Quarries in Rural Sri Lanka

### **Session T.2.2 - Materials Science and Engineering II**

- T.2.2-1 [ 11:00 ] - Effect of Grain Size of Steel on Ultrasonic Longitudinal Wave Velocity to Shear Wave Velocity Ratio
- T.2.2-2 [ 11:15 ] - Effect of Penetration of Corrosion on the Load-Bearing Capacity of Mild Steel
- T.2.2-3 [ 11:30 ] - Effectiveness of Natural Polymers as Surface Modifiers in Enhancing Reinforcing Action of Silica in Carboxylated NBR Latexes
- T.2.2-4 [ 11:45 ] - Fabrication and Characterization of Nanofibrillated Cellulose (NFC) Reinforced Polymer Composite
- T.2.2-5 [ 12:00 ] - Remote Estimation of Degree of Corrosion Using Ultrasonic Pulse Echo Methods
- T.2.2-6 [ 12:15 ] - Nano-Silver Impregnated Wrapping Film to Keep Fruit Fresh

### **Session T.2.3 - Software Engineering I**

- T.2.3-1 [ 11:00 ] - Q-learning Approach for Load-balancing in Software Defined Networks
- T.2.3-2 [ 11:15 ] - Feature Oriented Software Development Framework for Stock Exchange Systems
- T.2.3-3 [ 11:30 ] - A Clinical Decision Support System for Drug Conflict Identification
- T.2.3-4 [ 11:45 ] - Visual Design Platform for Wireless Sensor Network
- T.2.3-5 [ 12:00 ] - Challenges Faced by Agile Testers: A Case Study
- T.2.3-6 [ 12:15 ] - Adopting Design Thinking Practices to Satisfy Customer Expectations in Agile Practices: A Case from Sri Lankan Software Development Industry

### **Session T.3.1 - Transport and Logistics II and Technology Management**

- T.3.1-1 [ 15:30 ] - Evaluating the Speed-Flow Relationship of Urban Four-lane Roads under Heterogeneous Traffic Conditions
- T.3.1-2 [ 15:45 ] - Calibrating and Validating VISSIM Microscopic Simulation Software for the Context of Sri Lanka
- T.3.1-3 [ 16:00 ] - Impact of Performance Rewards on Employee Turnover in Sri Lankan IT Industry
- T.3.1-4 [ 16:15 ] - Continuous Integration and Continuous Delivery Pipeline Automation for Agile Software Project Management
- T.3.1-5 [ 16:30 ] - Role of Strategic Emotional Intelligence on Technological Capability, Technological Knowledge Management and Organisational Learning & Growth
- T.3.1-6 [ 16:45 ] - Factors Affecting the Intention to Adopt Big Data Technology A Study Based on Financial Services Industry of Sri Lanka



### **Session T.3.2 - Materials Science and Textile Engineering**

- T.3.2-1 [ 15:30 ] - Investigation of 3D Refractive Index Contrast Variations in PVG Based Photo Printed Passive Optical Integrated Circuit Components
- T.3.2-2 [ 15:45 ] - Analysing Non-Isothermal Curing Behaviour of Natural Rubber Compounds by Mathematical Modelling of Oscillating Disc Rheometer Curves
- T.3.2-3 [ 16:00 ] - Investigation of Plasticizer Evaporation of Local Electrical Cable Insulations
- T.3.2-4 [ 16:15 ] - Analysis of the Dimensional Change of Woven Fabrics from Loom State to Finished State
- T.3.2-5 [ 16:30 ] - Investigating the Ability to Transfer Antimicrobial Properties of Neem (Azadirachta Indica) Seed Oil to Cotton Knitted Fabrics
- T.3.2-6 [ 16:45 ] - Stretchable Conductive Yarn for Electronic Textiles Made Using Hollow Spindle Spinning

### **Session T.3.3 - Software Engineering II, and Power Systems, Electrical Machines and High Voltage Engineering II**

- T.3.3-1 [ 15:30 ] - Real-time Video Enhancement Using Graphical Processing Units
- T.3.3-2 [ 15:45 ] - A Modified Test Statistic for Maximum-Minimum Eigenvalue Detection Based on Asymptotic Distribution Thresholds
- T.3.3-3 [ 16:00 ] - Real-Time 2-D FIR Trapezoidal Digital Filters for 2.4 GHz Aperture Receiver Applications
- T.3.3-4 [ 16:15 ] - Log Periodic Antenna Based Partial Discharge Detector for Condition Monitoring of High Voltage Insulators
- T.3.3-5 [ 16:30 ] - Modelling Transfer Function of Power Transformers Using Sweep Frequency Response Analysis
- T.3.3-6 [ 16:45 ] - Effect of the Shape of the Insulator on Fractal Characteristics of Creeping Discharges
- T.3.3-7 [ 17:00 ] - Impact of Large-Scale Wind and Solar Power Integration on Operating Reserve Requirements of an Islanded Power System