



## GLOBAL INITIATIVE OF ACADEMIC NETWORKS

DECEMBER 16<sup>TH</sup> 2020 TO DECEMBER 20<sup>TH</sup> 2020

# PROGRAMMABLE CONTROLLERS WITH MACHINE LEARNING

## Overview

Programmable Controllers (PC) range from small modular devices with tens of inputs and outputs (I/O), in a housing integral with the processor, to large rack-mounted modular devices with a count of thousands of I/O, and which are often networked to other PC and SCADA systems. Programmable Controllers (PC) are often called as Programmable Logic Controllers (PLC), Programmable Automation Controllers (PAC) etc. Programmable Controllers are developed with several key industrial attributes. It would tolerate the shop-floor environment, it would support discrete (bit-form) input and output in an easily extensible manner, it would not require years of training to use, and it would permit its operation to be controlled. As many industrial processes have requirements involving faster response time, digital hardware greatly facilitate building reliable controllers where performance could be traded off for reliability. With the advent of machine learning techniques in place, provisioning of environmental control of the various industrial attributes like temperature and power quality can be efficiently implemented.

Course participants will learn various pertaining topics through lectures and hands-on experiments. Also case studies showing Industrial/research use and assignments will be shared to stimulate research motivation of participants.

<b>Modules</b>	<b>Architecture of PLC and Applications :</b> December 16 <sup>th</sup> & 17 <sup>th</sup> 2020 <b>SCADA Systems and PLC :</b> December 18 <sup>th</sup> 2020 <b>PLC Programming :</b> December 19 <sup>th</sup> 2020 <b>Machine and Deep learning for PLC :</b> December 20 <sup>th</sup> 2020
<b>You Should Attend If...</b>	<b>Number of participants for the course will be limited to FIFTY</b> <ul style="list-style-type: none"> <li>▪ You are an industry expert or research scientist interested in designing and programming with PLC's</li> <li>▪ You are working in designing of PLC and SCADA systems and would like to explore implementing machine learning on these systems</li> <li>▪ You are a student, research scholar or faculty from academic institution interested in learning how to do research on Programmable logic controllers, application of machine learning in PLC, etc.</li> </ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad: US \$500</b> <b>Industry/ Research Organizations: Rs. 10,000/-</b> <b>Academic Institutions Faculty: Rs. 3,000/-</b> <b>Students and Research Scholars: Rs. 2,500/-</b> The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage, and internet facility. The participants will be provided accommodation on payment basis.

## The Faculty



Dr. Ravindra Thamma is currently a Professor of Robotics and Mechatronics at Central Connecticut State University, USA. He serves as Department Chair of Manufacturing and Construction Management at CCSU and as program coordinator of Robotics and Mechatronics. Dr. Thamma has extensive background in laboratory and curriculum development to enhance education/research facilities and infrastructure to reduce the student learning curve when entering the workforce, while building a firm foundation for life-long professional development for the students. His teaching and research interests are programmable controllers, robotics, linear control systems, and intelligent systems. He is a member of IEEE, ISA, ATMAE.



Dr. Rajeswari Sridhar is an Associate Professor of Department of Computer Science and Engineering at National Institute of Technology, Tiruchirappalli. Her current research interests include, Natural language processing, Artificial Intelligence, Cloud Computing, Social media analysis, ML and DL. She is a member of CSI, IEEE, ACM.



Dr. N. Ramasubramanian is a Professor of Department of Computer Science and Engineering at National Institute of Technology, Tiruchirappalli. He received his B.E. degree in Electronics and Communication engineering and the M.E. degree in CS from REC Trichy, Tiruchirappalli, India, and the Ph.D. degree from the National Institute of Technology, Tiruchirappalli. He was a Senior Project Officer at the Department of CSE, IIT Madras, Chennai, India, from 1989 to 1991. He worked as a Lecturer at Anna University, Chennai, from 1991 to 1996, after which he joined the National Institute of Technology, Tiruchirappalli. His current research interests include multicore architectures, advanced digital design, processor architectures for ML and AI, reconfigurable computing, and security hardware. He is a member of IEEE.

## Course Coordinators

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