

Event-driven Controllers for IoT Green Applications

Tutorial presenter: Dr. Calin CIUFUDEAN

Stefan cel Mare University, Suceava, 13 University str., 720229,
Romania
ciufudean.calin@gmail.com, tel. +40723255571

KEYWORDS

Urban automation, Green Internet of Things, Sustainable development new paradigms, Ecological footprints, Event-driven Controllers, Multi-analytic sensors.

AIMS AND LEARNING OBJECTIVES

Our tutorial proposes sustainable development of urban communities seen through the new technologies involved in office and home automation, urban traffic and services automation as application areas to exchange new research results and ideas to explore synergies and foster scientific advancement of the event-based paradigm.

This tutorial provides event-formalisms for modeling and diagnosing both urban and industrial environment threats for the assurance of sustainable development of human modern habitats. We will also provide an event-diagnosis method of these challenges. A valuable insight to evaluation of methods and applications necessary for implementing urban regeneration are also shown.

The urban regeneration, in particular of building, public utilities and energy infrastructures, e.g. ecological footprint, is one of the basic steps for the development of a Smart City, where architectural and energetic innovative models and best practices can be tested.

Our tutorial examines the critical topics and the strategies for monitoring, risk assessment, innovative materials, in the urban areas, also analyzing aspects of seismic protections and building diseases. We mention that all these topics are also relevant one of the most prominent ICT technologies that underpin our society, e.g. the Internet of Things (IoT) and its new branches for a sustainable development, as a whole we call it Green IoT, for example:

- The "Things-Oriented" as a branch of IoT is focused on Things connectivity technologies e.g., RFID (Radio-Frequency Identification), NFC (Near Field Communications), WSN (Wireless Sensor Networks), etc.
- The "Internet-Oriented" is focused on the web-of-things layer for simplifying application development, IPv6 for internet connectivity and identification etc.
- The "Semantics-Oriented" is focused on technologies for accessing and leveraging the semantics of IoT, other reasoning technologies etc.

Modelling tools discussed and exemplified in our tutorial will deal with the following (and not only) frameworks:

1. Artificial Social Systems (ASoS)
2. Grid Petri Nets (GPNs)
3. Basic Equivalent Transfer Functions for GPNs

4. Perturbation Parameters Modelled with GPNs
5. Application to a Queuing Grid Network: practical example
6. Application to a IoT controlled Flexible Manufacturing System
7. Modelling Control and Hazards in Industrial Applications driven by IoT.

TARGET AUDIENCE

Audience with diverse background like research, academia, industry, architecture, medicine, can take advantage of this tutorial and can shape a new way of analyzing sustainable modern human habitats.

DURATION

90 min.

SHORT BIOGRAPHY OF PROF. CALIN CIUFUDEAN

Calin Horatiu Ciufudean is Associate Professor Ph.D. Eng. with “Stefan cel Mare” University of Suceava, Faculty of Electrical Engineering and Computer Science, Department of Computers, Control Systems, and Electronics.

- Courses and laboratories: Industrial Control Systems Diagnosis, Discrete Event Systems;
- Researcher in discrete event systems, and environmental sustainable development;
- Researcher and projects director for over 34 research projects (national and international);
- Author of over 160 scientific papers published in scientific journals and conferences proceedings abroad and in Romania;
- Author of 19 books published in Romania and abroad;
- Author or co-author of 32 inventions.
- Technical Expert of the Romanian Ministry of Justice.
- President of the Romanian Society of Electrical & Control Engineering, Suceava Branch.
- He is a member of the editorial boards of several international scientific journals and conferences of control systems and electric engineering science. He was designated chairmen and/or key note speaker at 38 international conferences.