DISTRIBUTED CONTROL SYSTEMS

Contact details

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<tr>
<th>Name</th>
<th>Distributed Control Systems</th>
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<td>Acronym</td>
<td>DCS</td>
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Site

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Faculty Department: Automation and Computer Science/ Automation

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Areas of expertise

Distributed control systems, embedded systems, real-time application, intelligent control etc.

Team and key skills

Prof. Dr. Eng. Tiberiu S. Letia has the research subjects in: real-time systems, distributed control system, software engineering, evolutionary systems, and intelligent control.

Prof. Dr. Eng. Adina Aştilean has the research subjects in has the research subjects in: real-time systems, distributed control system, software engineering, evolutionary systems, intelligent control.


Assist. Prof. Dr. Eng. Mihai Hulea (Phd) in the field of System Engineering. Research subjects in: real-time systems, distributed control system, software engineering, evolutionary systems, intelligent control.

Assist. Prof. Dr. Eng. Radu Miron (Phd) in the field of System Engineering. Research subjects in: real-time systems, distributed control system, software engineering, evolutionary systems, and intelligent control.


Assist. Dr. Eng. Maria-Magdalena Santa (Phd) in the field of System Engineering. Research subjects in: real-time systems, distributed control system, software engineering, evolutionary systems, and intelligent control.

Infrastructure

- 1 laboratory Rockwell box:
  a. CPU – Compact Logix L 32E (communication module Ethernet and Serial);
  b. Power Flex 40; (communication module Ethernet and Serial);
  c. Power Supply 1606 XLP 72 E;
  d. Panel View Plus 600; (communication module Ethernet)
  e. Module Digital I/O;
  f. Module Analogue I/O;
  g. Switch Ethernet Hirschmann.

- 1 laboratory Rockwell box:
  a. CPU – Compact Logix L 23E (communication module Ethernet and Serial), module digital I/O;
  b. Power Supply 1606 XLP 72 E;
  c. Panel View Plus 600; (communication module Ethernet)
  d. Switch Ethernet.

- 1 laboratory Omron box:
  a. CPU: CJ1M, CPU11-ETN;
b. communication module Ethernet, Serial and DeviceNet;
   c. power: PA 202;
   d. light sensor (communication module DeviceNet)
   e. Digital interface I/O.
- 1 laboratory Omron box:
   a. CPU: CPM1A 20;
   b. communication module Serial;
   c. drawing system in two axes; (laboratory prototype).
- 2 laboratory Omron boxes:
   a. CPU: CJ1M, CPU11-ETN;
   b. communication module Modbus Master / Slave;
   c. Power: PA 202;
   d. Digital input/output interfaces I/O.
- 3 laboratory Siemens boxes:
  - 1 communication kit for radio modem in 900 Hz frequency
  - Smart card development kit:
    a. ASEDrive IIIe USB Smart Card Reader;
    b. ASEDrive IIIe Serial Smart Card Reader;
    c. 10 ASECard Crypto smart cards.
  - 2 kit Systronix Java Development (microcontrollers programmable in Java);
  - 1 microcontroller Atmel;
  - 1 acquisition board with magnetic sensor;
  - Wireless communication module: Wi-Fi; 6 Bluetooth devices; 2 development kit with microcontrollers and Zigbee (16 devices); 2 GPS deices;
  - Oscilloscope Hameg with 2 channels la 20MHz.

Development strategy

The group is focused on finding some methods that automatically build and implement distributed control systems for a variety of application that fulfill real-time constraints.

Representative projects


Period: June 2009 – May 2012.

Identification system based on digital fingerprint with mobile terminals.
Grant CNMP: 11038/2007. Main result concern a distribute mobile system for person identification and security communication.

Real-Time intelligent system for management, control and information of railway traffic. Grant Cod CNCSIS: 1537/2007. The on-line scheduling problems are solved under real-time constraints. The train scheduling are performed such that the time specification are fulfilled. The resulted control system leads to a train traffic that met real-time constraints. The monitoring system worn when dangerous state are attained.

Intelligent control system of road traffic, research topic in the Postdoctoral project: Development and support of multidisciplinary postdoctoral programs in major technical areas of national strategy of Research - Development - Innovation” 4D-POSTDOC, contract no. POSDRU/89/1.5/S/52603, project co-funded by the European Social Fund through Sectorial Operational Program Human Resources Development 2007-2013, Objective of the research topic: Design and implementation of an road traffic monitoring real time system.
Period: June 2010 – May 2013

Significant results

DOI: 10.3182/20120403-3-DE-3010.00054


R. F. Miron, T. S. Letia and M. Hulea. Two Server Topologies for a Distributed Fingerprint-Based Recognition System, ICSTCCV2, IEEE - 15th International Conference on System Theory, Control and Computing, 14-16 oct. 2011, Sinaia,
Research & development in core areas

Automatic synthesis of control and monitoring systems for discrete event or hybrid, concentrated or distributed processes.
Verification of real-time applications.

Research & development in applied fields

Control and monitoring system for urban vehicle traffic
Control and monitoring system for railway traffic
Control systems for Flexible Manufacturing Systems
Distributed control for hybrid processes.
Design, verification and implementation real-time (embedded) applications.
Person identification based on digital fingerprint.

Consulting

Embedded systems, real-time application design, implementation and verification.
Distributed control systems for urban vehicle traffic or railway traffic.

Applied engineering services

Design, verification, implementation and testing of control applications.

Training

Design and implementation of real-time application,
Design and implementation of distribute control application
Distributed control of Transportation systems.

Fig. 1. Represent implementation of real-time application.

Fig. 2. Represent implementation of distribute control application.

Fig. 3. Represents verification, implementation and testing of control applications.