CENTRO DE INVESTIGACIÓN Y DE ESTUDIOS AVANZADOS DEL IPN

El ***Departamento de Control Automático***

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Event-Based Control Strategies: An Opportunity for Embedded Systems

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Planta Baja del Depto. de Control Automático, CINVESTAV-IPN, Unidad Zacatenco, D.F.

Abstract: In this talk, we address the emerging event-based control approach. Contrary to the classical scheme where the control is computed and updated in a periodic fashion, in an event-triggered setup the updating is based on an event function depending upon the dynamics of the system to control. As a result, the number of samples can be highly reduced (and consequently the CPU utilization) for the same final performance. Different cases illustrate the presentation. Some event-based PID control algorithms using level-crossing detection as well as state-feedback controllers based on Lyapunov sampling are firstly depicted. Simulation and experimental results are also presented. Finally, a general formula is introduced for the stabilization of nonlinear event-based controlled systems.

Sylvain Durand Chamontin was born on 1983 in France. He graduated as engineer in control and embedded systems in September 2007 from ESISAR (Grenoble-INP), Valence, France. He also received a Ph.D. in systems and control theory in January 2011 from Grenoble University when working in the NeCS project-team (an INRIA Rhône-Alpes and GIPSA-lab joint team), Grenoble, France. In 2011, he then worked for a one-year post-doctoral research position financed by the Integrative Research Center (CRI PILSI) in a strong collaboration with the LISAN and LIALP laboratories from the CEA-Leti, Grenoble, France. He is currently a visiting post-doctoral researcher in the French-Mexican laboratory on computer science and control (UMI LAFMIA) at CINVESTAV, Mexico D.F. His main research interests focus on reducing both
i) the energy consumption and
ii) the control computational cost in real-time embedded electronic systems with high resource constraints, using in particular event-based control techniques.