CEIES Short Course

Center of Excellence in Intelligent Engineering Systems

CENTER OF EXCELLENCE IN INTELLIGENT ENGINEERING SYSTEMS

Speaker: Prof. Maamar Bettayeb

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Session	Day	Date	Time
First	Tuesday	27/1/2015	11:00 – 12: 15
Second	Tuesday	27/1/2015	13:00 – 14:20
Third	Wednesday	28/1/2015	11:00 – 12: 15
Fourth	Wednesday	28/1/2015	13:00 – 14:20

Venue: **Engineering Building, Second floor, Room 24C28 (ECE Seminar Room)**

Title

Approximation, Identification and Control of Fractional Systems

Abstract

In this short course, the speaker will first review fractional calculus, a generalization of the notions of integer-order differentiation and integration to non-integer orders. Even though fractional calculus is nearly 300 years old, its application to science and engineering in general, and to dynamic systems and control of physical systems in particular, is relatively recent and is considered a new emerging area of research.

It is shown in this short course, how fractional calculus is successfully applied to dynamic systems governed by fractional-order differential equations, where classical ordinary differential equations results are generalized to the fractional case.

The speaker will present recent results on the approximation by rational systems, identification and control of fractional dynamic systems. Both fractional state feedback as well as fractional IMC-PID controllers are developed.

Applications to heat diffusion processes and inverted pendulum are detailed. Promising directions of research in fractional systems modeling, identification and control are also presented.

ALL ARE CORDIALLY INVITED