



UAA Professional Development Seminar Series

# Imperfections, Nonlinearities, and Noise to Improve Control System Design

Presented by: Dr. Luigi Fortuna



**ABSTRACT:** In this lecture the presenter will give focus as Imperfections, Nonlinearities and Noise could play a positive role in circuits and system control design. Therefore the concept as to use in a positive manner what is generally considered negative in the systems is remarked.

The following main topics will be discussed:

- 1) The aspects of technological imperfections are shown. The possibilities to obtain self organization in large scale electromechanical system is shown. Moreover as imperfections allow important emerging behavior in electronic circuits will be emphasized.
- 2) The nonlinear phenomena of jump resonance will be presented. The important role in conceiving drift frequency sensors based on multi jump resonance electronic circuits will be illustrated.
- 3) The introduction of nonlinearities to improve feedback performances will be shown. The lecture will summarize the main results obtained by the presenters and other researchers in the topic in the last years. The lectures is addressed to a wide audience of

people working not only in the areas of electrical/electronic engineer. In fact the subject is introduced in order to stimulate the interest of people working in different areas. The seminars will include also video of experiments and industrial applications of the previous discussed concepts.

**BIO:** Luigi Fortuna is Full Prof of Automatic Control at the University of Catania ( ITALY ) since 1994. His scientific interests include Robust Control, Nonlinear Circuits and Systems Design. He has been Dean of the Engineering Faculty of his University (2005- 2012). Fellow IEEE since 2001. He is coauthors of 12 USA Industrial Patents. He published (with coauthors) 20 books with Springer, World Scientific, CRC press. Is actually Editor in Chief of the NLENG Journal.

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