



IEEE Microwave Theory and Techniques Society Washington DC/Northern VA Chapter

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Overview of Chaos and Its Information Applications

Dr. Christopher P. Silva
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The Aerospace Corporation
El Segundo, California

Date: Tuesday, April 15 2008

Time: Reception 5:30 pm, Dinner 6:00-7:00 pm, Lecture 7:00 pm,

Place: MITRE Corporation Building-2 seminar room, McLean VA

Directions: [click here](#) The walkway to Building 2 is accessible from level 2 of the parking garage. Parking is free.

Cost: The lecture is free. Optional Dinner is \$15.00, payable on-site.

This is the third lecture in the MTT-S Lecture Series for 2007-08. All attendees are welcome to meet and greet the speaker at the reception and join the committee for a catered dinner before the lecture. Dinner reservations are required, cost \$15.00. **RSVP for dinner only** by Thursday April 10 to Roger Kaul, 301-394-4775, r.kaul@ieee.org or to Bruce Levine at bruce.levine@ieee.org.

Abstract: The field of chaos, a complex random-like behavior found in nonlinear dynamical systems, has continued to mature internationally in its real-world application to information transmission and processing. This presentation will first provide the basic framework for the applied chaos segment that follows, introducing the general terminology/characteristics of chaos and its synchronization, followed by its important advantages and implications for engineering applications. A wide-ranging list of application areas will be highlighted, covering analog/digital encryption, noise signal processing, baseband through optical communications, radar, cellular nonlinear networks (analog computer), electronic measures, and bifurcation engineering. Technology development examples, status and future outlook will also be included, as well as hardware development work at The Aerospace Corporation on chaos-based RF communications and radar.



Bio: Dr. Christopher P. Silva received the B.S., M.S., and Ph.D. degrees, all in electrical engineering, in 1982, 1985, and 1993, respectively, from the University of California at Berkeley. Professor Leon O. Chua directed his graduate work with an emphasis on nonlinear circuit and system theory. His dissertation work was on the analytical detection of chaotic dynamics in nonlinear circuits, which included a detailed rigorous study of the qualitative dynamics of both the well-known double-scroll chaotic circuit and second-order analog phase-locked loops.

He joined the Electronics Research Laboratory of The Aerospace Corporation in 1989 and is currently a Senior Engineering Specialist in the Communication Electronics Department, Communications &

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Networking Division. He has been the principal or co-investigator on several internally funded research projects addressing nonlinear microwave CAD, private/secure communications and radar by means of chaos, and the characterization and compensation of nonlinear satellite communications channels, the latter of which has evolved into an advanced technology development for several military space programs. He has given many invited talks at conferences, society meetings, universities, industry, and laboratories on the applications of nonlinear techniques to communications and signal processing, along with corresponding publications in various venues.

Dr. Silva is a Fellow of IEEE, a Senior Member of AIAA, and a member of AAAS, AMS, and SIAM.

New Local Chapter Administrative Committee members are needed. Really. If you are reading this sentence, then we need you to help us in the Chapter.

Join us in planning the next lecture series. Please volunteer... everyone has something to offer. The next administrative meeting will be held during the spring of 2008.

Please contact 2008 Chapter Chair Bruce Levine at bruce.levine@ieee.org

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