When: Friday 15:00 – 16:00, September 27, 2019
Where: ETB 1035

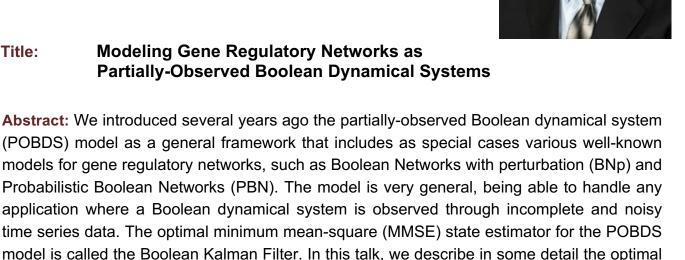**Speaker:**   **Ulisses Braga-Neto, Ph.D.**

Professor
Department of Electrical and Computer Engineering
Texas A&M University

Title: **Modeling Gene Regulatory Networks as Partially-Observed Boolean Dynamical Systems**

Abstract: We introduced several years ago the partially-observed Boolean dynamical system (POBDS) model as a general framework that includes as special cases various well-known models for gene regulatory networks, such as Boolean Networks with perturbation (BNp) and Probabilistic Boolean Networks (PBN). The model is very general, being able to handle any application where a Boolean dynamical system is observed through incomplete and noisy time series data. The optimal minimum mean-square (MMSE) state estimator for the POBDS model is called the Boolean Kalman Filter. In this talk, we describe in some detail the optimal Boolean state estimation problem, as well as approaches for parameter estimation and control of Boolean networks using the POBDS model, with application in the inference, fault detection, sensor selection, and optimal intervention in gene regulatory networks from time series of gene expression measurements.

Bio: Ulisses Braga-Neto received his Ph.D. in Electrical and Computer Engineering from The Johns Hopkins University in 2002. He joined the Electrical and Computer Engineering Department at Texas A&M University in 2007, where he is currently Professor. His research focuses on Signal Processing and Pattern Recognition. Dr. Braga-Neto is the inventor of the Bolstered Error Estimation and Boolean Kalman Filter algorithms. He is a member of two technical committees at the IEEE Signal Processing Society (SPS), and is currently the SPS Liaison for the Machine Learning in Signal Processing conference. He was the 7th President of the Mid-South Computational Biology and Bioinformatics Society (MCBIOS) professional society in 2011. He has authored over 135 peer-reviewed publications, including two books (one in press). Dr. Braga-Neto received the NSF CAREER Award in 2009 and the Outstanding Professor Award from the Department of Electrical and Computer Engineering at Texas A&M University in 2013.