



BOSTON UNIVERSITY STATISTICS
AND PROBABILITY SEMINAR SERIES

**Data-Driven Diagnostics and Model Building
in Nonlinear Dynamics**

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Thursday, November 1, 2007, 4:00-5:00pm
Mathematics and Computer Science (MCS) Building, Room 149
111 Cummington Street, Boston

Tea and Cookies at 3:30pm in MCS 153

Abstract: This talk examines the problem of data driven model building for systems thought to be described by nonlinear differential equations. I argue that lack of fit may be best represented as an unknown, smooth, additive input into these equations. Treating such inputs as a residual, standard diagnostic tools may be applied. The problem becomes less straightforward when only some components of a system are observed and I discuss approaches to dealing with this. The standard model building paradigm, however, does not extend to more complex modeling choices such as the use of higher-order systems or extra components. I show that techniques from the field of Chaotic Data Analysis may be used to indicate where such choices are appropriate. These results also provide some cautionary lessons about the limitations of data-driven inference in these systems.

For directions and maps, please see <http://math.bu.edu/research/statistics/statseminar.html>.