Colloquium

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Friday, November 12, 2010 at 2 pm in Bell Hall 143

Existence and Characterization Theorems for Interval and Fuzzy Differential Equations

Abstract

When modeling real-world phenomena, information available about a dynamical system is often uncertain or incomplete. The uncertainties are inherent and they are not always of statistical type, instead, they are epistemic, i.e., they may be due to the lack or imprecision of our knowledge about the data or even about the model. Such uncertainties are typically modeled by interval or fuzzy data. One of the main goals of my research is to gain a better understanding of the propagation of epistemic uncertainties in a dynamical environment governed by differential equations.

It is a natural idea that the propagation of interval, or fuzzy uncertainties in a dynamical system can be modeled by Interval, or Fuzzy Differential Equations. Despite very important development of the topics over the last half-century, one can see that a widely spread, realistic, practical and theoretically well founded definition of the derivative of an interval, or fuzzy-valued function is still missing. Recently, novel differentiability concepts were introduced and investigated in this direction.

The talk will focus on interval-valued functions, fuzzy-valued functions and their derivatives, interval and fuzzy differential equations. Local existence of two solutions and characterization theorems for interval/fuzzy differential equations by ODEs will be investigated together with several examples.

For further information, please contact Dr. Emil Schwab, eschwab@utep.edu
Refreshments will be served in front of the colloquium room,
15 minutes before the start of the colloquium.