Applied Dynamics Group Seminar

Hopf bifurcation analysis of a general non-linear delay differential equation

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Abstract

This work represents Hopf bifurcation analysis of a general non-linear differential equation involving time delay. A special form of this equation is the Hutchinson-Wright equation which is a milestone in the mathematical modelling of population dynamics and mathematical biology. Taking delay parameter as a bifurcation parameter, Hopf bifurcation analysis is studied by following the theory in the book by Hazzard et al. By analyzing the associated characteristic polynomial, we determine necessary conditions in order to this analysis, the direction of bifurcation, the stability and the period of a periodic solution to this equation are evaluated at bifurcation value by using Poincaré normal form and center manifold theorem. The theoretical results are supported by numerical simulations.

Undergraduate students are also welcome.

Date: **Thursday, March 22, 2012**
Time: **17:00**
Place: **M-203 Seminar Room, Department of Mathematics, METU**