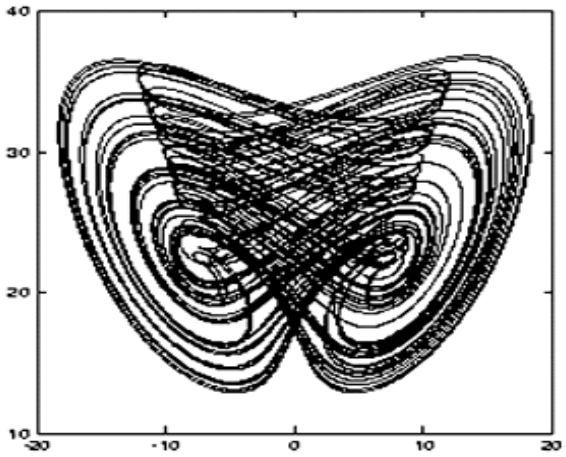
EE 5323: Nonlinear Control Systems
Fall 09

F.L. Lewis
http://arri.uta.edu/acs

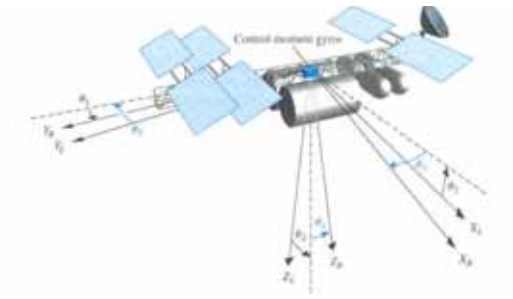
This course shows how to analyze and design feedback control systems for complex nonlinear systems such as aerospace and aircraft systems, robots, ground vehicles, and industrial processes. We cover passivity, Lyapunov energy function analysis, describing functions, and new techniques such as feedback linearization, backstepping, and dynamic inversion. Included is an introduction to bifurcations and chaotic systems. Prerequisite: a knowledge of EE 5307 or equivalent is necessary. Course outline is linked to http://arri.uta.edu/acs



Chen Attractor for chaotic system

Nonlinear motion tracking control for robotic systems

Aircraft autopilots and control augmentation systems



Satellite attitude and orbit control

Analysis of the interactions between multiple nonlinear systems explains sociobiological behaviors such as schooling, flocking, and synchronization of organisms, and the spread of disease and rumors.