

Some ideas for nonlinear dynamics project:

1. Rock, paper scissors
2. Flocking
3. epidemic models
4. Tumor growth and harvesting models (e.g. seasonal harvesting)
5. chemical reactions
6. Nonlinear equations of innovation and diffusion.
7. Lorenz Composer (musical melodies from Lorenz chaotic attractor)
8. Synchronization
9. Fitness models (evolutionary games and Nash equilibria)
10. Predator prey models
11. Evolution of languages
12. Laser rate equations (e.g. Two mode lasers)
13. Van der pol oscillator
14. Political opinion dynamics
15. Henon-Heiles system
16. Nonlinear Pendulum
17. Budworm Forest models (Strogatz 8.1.10)
18. Interacting Bar magnets (Strogatz 8.1.12)
19. Bacterial respiration (Strogatz 8.2.10)
20. Chaos: Rikitake model of geomagnetic reversals (Strogatz 9.2.6)
21. Using chaos to send secret messages (Strogatz 9.6)
22. Spreading of advertisement
23. Excitable systems: Fitzhugh Nagumo model, Hodgkin-Huxley model
24. Economics (e.g. Solon Swan model)
25. Biochemical switch
26. Enzyme Kinetics: Michaelis-Menten Kinetics

*You can search for your own topics and also use any of the relevant problems in modeling and simulation course and use methods discussed in the course on the.*