University of Colorado
Department of Computer Science

Chaotic Dynamics – CSCI 4446/5446
Spring 2023
Final Project Guidelines

All students registered for graduate credit in this class must complete a final project. This project will be the source of *40% of your grade for the class* and will take the place of the last three problem sets. It will consist of a short, self-contained, well-chosen piece of original, independent research that must follow these guidelines:

- it must include a literature search on the chosen topic

- it must integrate material from the literature *and* significant numerical experiments using at least one of the computer tools that you built during the semester

- an in-class presentation of the main points and results of the project will be scheduled for each project at the end of the semester

- a formal research paper — footnotes, bibliography, formal structure, etc. — will be due roughly a week after the oral presentation

Topics are up to you, but are subject to a three-phase approval process: a quick paragraph to give me an idea about your topic, a ten-minute meeting to talk about it, to be followed a few weeks later by a one-page proposal with a preliminary bibliography if your topic is satisfactory.

An example project might be to pick some interesting system, idea, or technique, look through the literature (and not just what's available online!) to see what other people have observed in that system, repeat those experiments with your own tools, and write a paper that compares, contrasts, **and extends** (at least a bit) those results. Another example might be to take some technique or algorithm that has come up during the semester, explore some alternatives — both in the literature and on your computer — and report on the results.

Synthesis is an important component of this project. Regurgitating what you read and doing a few simple corroborations is inadequate. Successful projects will demonstrate curiousity, investigation, analysis, and — most importantly — creative, independent thought.

The two formal presentations — the paper and the in-class presentation — are important parts of this project. A later handout will outline the requirements for each in more detail. The word count of the paper will be limited, so you'll have to write carefully and use figures to tell as much of the story as possible. It should also be in good English; buy a copy of Strunk and White *now* and start working through it if you have trouble

organizing and phrasing your thoughts. The presentation should target the entire class (i.e., should be understandable to the undergrads), should be professionally prepared with visual aids that convey your ideas effectively, and should be a good guide to the salient points of your project. The paper, since you will have more time to devote to it, should be a well-rounded, detailed, and coherent final product; for the in-class talk, you need not have all the details worked out, but you must be able to present the main themes and the majority of the original results (e.g., numerical experiments) that you proposed.

Important Dates:

- 14 March: one-paragraph topic descriptions due by 5pm via Canvas

- week of 20 March: one-on-one meetings to discuss project topic & scope

- 6 April: one-page proposals due

- 25 and 27 April: in-class presentations

- 4 May: papers due by 5pm. See the PS13 handout for submission guidelines.