University of Utah, Mathematics Department

CHAOTIC MOTION
IN
DOUBLE PENDULUM SYSTEMS

A Final Computing Project

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1. Introduction

A single pendulum is a classical example of simple harmonic motion. When constrained to small angles the pendulum will swing periodically and consistently. By simply adding a second pendulum at the end of the first, the system transforms into a classical example of chaotic motion. Even though these two systems are governed by the same physical laws of motion and only being acted upon by one force (gravity), a double pendulum is *heavily* dependent on initial conditions. We will use an approximation to solve this equation to view the behavior; the approximation we will use is the fourth order Runge-Kutta method.

2. Mathematical Model

3. Numerical Model

4. Results

5. Conclusion

A. Julia Code