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Simulation and Visualization of Chaos in a Driven Nonlinear Pendulum – An Aid to Introducing Chaotic Systems in Physics GODFREY AKPOJOTOR, Theoretical and Computational Condensed Matter Physics, Physics Department, Delta State University, Abraka, Nigeria, LOUIS EHWERHEMUEPHA, Computational Science, Chapman University, Orange, California, USA, OGHENERIOBORORUE AMROMANOH, Department of Biosystems Engineering School, University of Manitoba, Manitoba, Canada — The presence of physical systems whose characteristics change in a seemingly erratic manner gives rise to the study of chaotic systems. The characteristics of these systems are due to their hypersensitivity to changes in initial conditions. In order to understand chaotic systems, some sort of simulation and visualization is pertinent. Consequently, in this work, we have simulated and graphically visualized chaos in a driven nonlinear pendulum as a means of introducing chaotic systems. The results obtained which highlight the hypersensitivity of the pendulum are used to discuss the effectiveness of teaching and learning the physics of chaotic system using Python. This study is one of the many studies under the African Computational Science and Engineering Tour Project (PASET) which is using Python to model, simulate and visualize concepts, laws and phenomena in Science and Engineering to compliment the teaching/learning of theory and experiment.

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