

Review Form 3

Journal Name:	Journal of Advances in Mathematics and Computer Science
Manuscript Number:	Ms_JAMCS_123582
Title of the Manuscript:	Stability Analysis of the Chaotic Reverse Butterfly-Shaped Dynamical System Using Hurwitz Polynomials
Type of the Article	Journal

General guidelines for the Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<p>Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.</p>	<p>Exhibition of Chaos in the system has been explored through the determination of Lyapunov exponents, being positive gives reverse butterfly – shaped characteristics. A simple differential equation represented in state variable from $\dot{x} = Ax$: it is in linear Homogenous form. This has been derived from $\dot{x} = f(x)$ which is a nonlinear equation.</p> <p>The present work depicts the simple procedure of determining the stability of equilibrium points of nonlinear systems using the eigenvalues of A in formulating Hurwitz determinant/matrix and Routh Hurwitz array of the characteristic equation of the linearized version of nonlinear Equation.</p> <p>The simple treatment of the problem of determining stability of nonlinear systems. Hence it is worth publishing and recommended for publication with a little correction/revision as has been pointed out in the Minor REVISION comments.</p>	
<p>Is the title of the article suitable? (If not please suggest an alternative title)</p>	<p>The title of the article is suitable. If one clause is added it will be more suitable i.e. “Stability Analysis of the Chaotic Reverse Butterfly- Shaped Dynamical System Represented in State Variable Form Using Hurwitz Polynomials.</p>	

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<p>Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.</p>	<p>The stability of a dynamic system of differential equations in state variable form describes how it responds to significantly small perturbation. This qualitative behaviour of the system of differential equation is studied using Lyapunov or Hurwitz polynomials. The later reduces the problem of stability of equilibrium points of nonlinear systems to an algebraic linearized system, providing necessary and sufficient criteria in terms of Hurwitz determinant/matrix or Routh Hurwitz Array for which the system is stable. In this paper, the stability analysis of the chaotic reverse butterfly shaped dynamical system is presented using Hurwitz polynomials. The proposed method/procedure has been illustrated lucidly and validated with numerical simulations in MAPLE software.</p>	
<p>Are subsections and structure of the manuscript appropriate?</p>	<p>Fine and acceptable.</p>	
<p>Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.</p>	<p>The manuscript suggests a simple procedure of stability analysis of equilibrium points of nonlinear systems through the linearized version of a dynamic system represented in the state variable form of linear homogeneous matrix differential Equation. In the process the exhibition of Chaos has been studied to a greater extent. Robust means which addresses uncertainty i.e. randomness i.e. in a stochastic system in particular. The text of the manuscript is technically correct but may not be robust in that sense. It has the merit of acceptance for publication. However, the robustness can be tested with random signals in a separate article in future.</p>	
<p>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</p>	<p>The author has used minimum Nos. of references. However, it will be better appreciated if five more references may be cited from the present decade. The references cited in the text starting from introduction to the last section 4 are to be arranged in the list of References at the end serially in ascending order: [1] [2] [11]</p>	

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<u>Minor REVISION</u> comments Is the language/English quality of the article suitable for scholarly communications?	The statement: "From the eigenvalues (3.8), $\lambda_1, \lambda_3 < 0$. λ_2 is also negative because the square root is an increasing function in $[0, \infty$. We conclude that the origin is a saddle." Saddle means unstable equilibrium. Hence the author has to confirm λ_2 is positive ? Besides, the text must be passed through Gmail for grammar check.	
<u>Optional/General</u> comments		

PART 2:

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

Reviewer Details:

Name:	Kartik Chandra Patra
Department, University & Country	C. V. Raman Global University, India