Review Form 3

Journal Name:	**Journal of Engineering Research and Reports**
Manuscript Number:	**Ms_JERR_121522**
Title of the Manuscript:	**μ-Synthesis of an under-actuated bridge crane**
Type of the Article	**Original Research Article**

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PART 1: Review Comments

Compulsory REVISION comments	**Reviewer's comment**	**Author's Feedback** *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*
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.	The manuscript describes a particular and innovative method: "During crane operation, the distribution of load mass may be non-uniform, which leads to the model uncertainty of the crane. Additionally, external disturbances such as wind and friction can cause oscillation of crane loads". Also, the analysis of the non-uniform distribution of the center of mass appears to be an important element of the manuscript itself. Furthermore, the use, as written in the manuscript, of "a μ-synthesis robust controller designed using the DK-iteration algorithm" appears to be a relevant element of novelty in the study of closed-loop crane motion.	
Is the title of the article suitable? **(If not please suggest an alternative title)**	Yes, it appears correct and comprehensive.	
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.	I find the abstract of the article well-written, clear and comprehensive.	
Are subsections and structure of the manuscript appropriate?	Yes, I consider the subsections and structure of the manuscript appropriate.	
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.	The manuscript appears correct, well structured, understandable, and absolutely of a valid level. The subject of the manuscript, that is the μ-synthesis of a robust controller using the DK-iteration algorithm, appears innovative. The model and the solution method appear clearly outlined. As well as the description of the μ-Synthesis and DK-iteration. However, it would have been better to also represent some graphs relating to the simulation of the behaviour of the crane in stopping, carrying out tests with weights of some theoretical tons and lengths of at least 15-25 meters for the load. Only in this case, based on the stopping space obtained (which must be the minimum possible distance, compatible with the load and the height) it will be possible to evaluate the actual goodness of the developed method. This is a primary factor in the judgment on the actual practical effectiveness of the proposed method.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.	In general, yes they are sufficient. Nevertheless, I can suggest: **DOI: 10.1007/s11012-024-01846-7, "**Using a robust mu-synthesis based controller to eliminate the adverse effects of uncertainties and external disturbances in nonlinear 3D overhead cranes with hoisting mechanism". July 2024.	

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Minor REVISION comments **Is the language/English quality of the article suitable for scholarly communications?**	English could be improved in some parts. Some spelling and grammar should be checked carefully. One practical approach for authors to optimize their articles could be to incorporate proofreading tools such as Grammarly.	
Optional/General comments	In conclusion, we can say that the manuscript appears to be an excellent work in the field considered. However, the main objection we make is the lack of simulation tests in the crane stop with high cable lengths and high weights transported. In conclusion, we can state that the manuscript appears to be an excellent work in the field of closed-loop bridge crane simulation. The System and the method appear well and clearly described. However, the main objection we make is the lack of simulation tests in the crane stop with high cable lengths and high weights transported.	

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?	*(If yes, Kindly please write down the ethical issues here in details)*	

Reviewer Details:

Name:	**Roberto P.L. Caporali**
Department, University & Country	**Italy**