Response to reviewers:

Reviewer 1:

1. 4 independent variables and 6 dependent variables were introduced in this study, please advise the process of independent variables screening, and has the correlation among 4 independent variables been considered?
   1. Technically there would be minor correlation between the Length, Beam, and Draft inputs, as during the ANSYS modelling phase, the barges were kept to reasonable proportions, i.e. the vessel that is 25 meters in length did not have a data point where the beam was 1 meters, or where the draft was 0.15 m.
2. When datapoints are not sufficient, k-fold validation may be a better way than 80/20 for training and test dataset split.
   1. Thank you for the suggestion. We will use this during the next iteration of the NN model.
3. The error analysis largely relied on R square and RPD, RMSE/MAE are recommended to introduce to show prediction performance.
   1. We agree on this point. Added MAE error to the error analysis.
4. Also, a discussion of hyper parameters is suggested to add in this manuscript.
   1. Added hyperparameter details into the Model Architecture section of the paper.
5. Page 2 “The application of NN in the marine industry is in its infancy” is not accurate, please do further literature review on machine learning/ deep learning on maritime industry.
   1. Changed wording in paper. Most papers that were found during the literature review were published in 2016 or more recent, which is what led to the wording.
6. Page 2, Data collection: Add more descriptions of boundary determination and 214 box barges information.
   1. Added details about the determination of barge sizes.
7. Page 3, Table 2: Statistically, RX and RY cannot represent the whole dataset due to low R square values, please specify more regarding this, why those two still listed as dependent variables as stated “the curve fit failed to make the exponential equation equal to 0, which in turn pulled the R-Squared score down significantly”
   1. Agree strongly. This was residual from when all degrees of freedom were being fit to the damped spring equation. This has been remedied by fitting different degrees of freedom to different equations, as described in Equations 6, 7, and 8. The R-Squared of the curve fits are now much higher.
8. Page 10, reference: There is one typo for the last reference.
   1. Removed reference in place of one of the papers cited in removed reference.

Reviewer 2:

1. Equation 1 is for a single degree of freedom system. Authors may want to include an equation that is for six degrees of freedom.
   1. As the model considers each degree of freedom individually and the cross-coupling is determined by the neural network weights, representing the RAO equation as a single-DOF system was chosen.
2. In this context, the molded depth of barge is immaterial since the wetted surface of a floating vessel is modeled in hydrodynamic analysis. Avoiding wave overtopping is irrelevant since it is not part of the numerical simulation.
   1. Removed confusing wording.
3. The authors could have as easily used lightship approximation of radii of gyration instead of using moment of inertia of a solid box (equations 3, 4, and 5).
   1. This will be considered in a future iteration of the model. For the sake of simplicity, solid-body moments of inertia were used, as the primary focus of this paper is on the creation of a neural network and not the determination of the physical properties of box barges.
4. Questions on equation 6:
   1. What is ‘x’ in equation 6, frequency?
      1. Yes, added clarification in paper
   2. Equation 6 is expected to fit RAO amplitude. But engineering analysis requires complex RAO. What would be the procedure to estimate real and imaginary parts of the vessel RAO?
      1. In this proof-of-concept, we have simplified the RAOs to be only real. It is possible that the complex RAO cannot be modelled using these methods because of the assumptions that have been made in the data collection phase.
   3. Is this equation appropriate for all degrees of freedom?
      1. The curve fitting has been changed to vary by degree of freedom
   4. Will this type of equation work for vessel shapes other than a barge?
      1. Unknown, and so far, untested. Likely yes, as the model will adapt the neural network weights to properly predict a different hullform.
5. Page 4: There are 18 values for each datapoint. Are these 3 curve fit parameters times 6 DOF?
   1. Yes. Added clarification.
6. Page 4, last paragraph: Remove additional text “Figure 3” in the third line from the bottom.
   1. Removed parenthetical text.
7. Page 5, Table 3: The notation, “(,4)” for example, is unclear. Please clarify.
   1. This is the official way that TensorFlow reports layer shapes. Adjusted representation to be clearer to those not familiar with machine learning.
8. Page 10, “Conclusion”:
   1. In the sentence “A neural network is set up and adjusted to produce the most accurate results” – Describing the results as “most accurate” is a stretch. A more appropriate description would be “reasonably good estimate”.
      1. Rephrased wording.
   2. In the sentence “… feasibility of using a neural network to replace the traditional solution process …” – This type of procedure will never replace mathematically consistent (to appropriate order) diffraction/radiation analysis. Authors may want to rephrase the sentence.
      1. Rephrased wording.
9. References: Incomplete paper title in Reference #3.
   1. Removed reference in favor of another source cited by the removed reference.