

- ❖ The reviewer's feedback highlighted a limitation due to the small dataset. In response, we updated the manuscript to explicitly state in Section 3.1, 'Dataset': "We emphasize that our simulations resulted in a total of 8,800 graphs."
- ❖ The reviewer proposed to explore how GRAM's performance changes with different combinations of metrics or types of graphs (e.g., functional vs. structural connectomes). In response, we updated the 'Limitations and Future Directions' part as follows: "Future research should explore a broader range of metrics (e.g., that capture global network properties) and evaluate the model across various graph datasets (e.g., functional vs structural connectomes) for different applications."
- ❖ The reviewer mentioned that the paper compares GRAM to individual metrics but not to other existing methods for assessing graph quality or similarity, such as graph edit distance or graph kernel methods. Hence, we added in the 'Limitations and Future Directions' section: "Additionally, future work should include a comparison between GRAM and other methods for assessing graph quality. Future studies will also incorporate the use of GAN-generated data to further validate our approach."
- ❖ The reviewer highlighted that the paper doesn't demonstrate how improvements in graph quality assessment translate to clinical applications. In answer, we added this sentence in the 'Conclusion' as follows: "This approach is a significant step towards establishing a universal graph quality index for graph-based predictive studies (e.g., predicting disease progression in Alzheimer's, analyzing brain network development in infants)."
- ❖ The reviewer said that the paper doesn't discuss GRAM's computational cost compared to individual metrics. To address this, we included the following information in the 'Training details' section: "The training of GRAM took 1 hour and 14 minutes."
- ❖ The reviewer's feedback highlighted that there were typos in the paper, "genrated" in Fig. 1 and "refrence" in Fig. 3 caption. The bottom pink banner for Fig 1 also has some distortion where text runs over weirdly. In response, we changed the mentioned words and updated the figure 1 accordingly.
- ❖ The reviewer mentioned that The paper does not justify some of the assumptions made, for example, why the distortion is proportional to the number of edges with $w \neq \hat{w}$ and not the magnitude of the difference. Therefore, we added in paragraph 2, section 2.1 the following sentence: "The objective is to detect any distortion in the generated graph, treating any alteration in edge weights as significant."
- ❖ The reviewer commented that the assumption of linearity of distortion with respect to the reported metric is not justified. As a result, we updated paragraph 1 section 2.2 by the following sentences: "We opt for a linear model due to its ease of interpretation and analytical benefits [8]. In graph distortion context, the linear relationship clarifies how changes in edge weights impact overall metrics, enhancing result communication."
- ❖ The reviewer pointed out that in the introduction section, the authors reviewed different GAN methods but not different assessment metrics. Accordingly, we updated the 'Introduction' (last sentence of paragraph 3) as follows: "Instead, quantitative metrics (e.g., centrality measures [7], Average Neighbor Degree [26] and Diversity Index [20]) are, thus far, a single way to evaluate the quality of the generated graphs."
- ❖ The reviewer indicated that the training process of the metric requires a more detailed explanation. Therefore, we added to the 'Training details' section the following

sentence: "We used an 80/20 split, resulting in a training set of 7,040 samples and a testing set of 1,760 samples."

- ❖ The reviewer asked for the explanation of surfaces S_r and S_p . We explained that and revised the manuscript (last paragraph in section 2.2): " $C(x)$ denotes the line defined by C values, while $f_{MLP}(x)$ corresponds to the polynomial approximation function of B (the MLP output) multiplied by A ."