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### *Reply:*

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## REPLY:

**W**e thank Larroza and colleagues for their interest in our article “Computer-Extracted Texture Features to Distinguish Cerebral Radionecrosis from Recurrent Brain Tumors on Multiparametric MRI: A Feasibility Study.”<sup>1</sup>

We are responding to the following comment by Larroza and colleagues in their letter: “Our results may have been affected by the classifier being contaminated by sections from the same patient being used in both the training and testing sets during classification.”

Our understanding of the analysis in the article by Larroza et al<sup>2</sup> was that it was done on a lesion basis. The study comprised 115 lesions from 73 unique patient studies, with some patients having >1 lesion in different regions of the brain. Specifically, as mentioned in Larroza et al, the authors merged training and test sets and performed repeated training/test splits 100 times, holding 70% in training and then averaging the area under the curve values on test sets.

After we read the article by Larroza et al,<sup>2</sup> it was not clear whether lesions from the same patient appeared simultaneously in the training and test sets. This could bias analysis because ad-

jacent MR imaging sections tend to be highly correlated; thus, the features extracted (albeit from 2 different lesions from the same patient) might also be correlated. Thus, for a patient, including features from one lesion in training and features from another lesion in the test set within the same iteration of cross-validation may lead to overfitting<sup>3</sup> and may yield unreliable results. It is not clear that patient-specific separation across lesions was ensured during their cross-validation analysis.

## REFERENCES

1. Tiwari P, Prasanna P, Wolansky L, et al. **Computer-extracted texture features to distinguish cerebral radionecrosis from recurrent brain tumors on multiparametric MRI: a feasibility study.** *AJNR Am J Neuroradiol* 2016;37:2231–36 CrossRef Medline
2. Larroza A, Moratal D, Paredes-Sánchez A, et al. **Support vector machine classification of brain metastasis and radiation necrosis based on texture analysis in MRI.** *J Magn Reson Imaging* 2015;42:1362–68 CrossRef Medline
3. Hastie T, Tibishirani R, Friedman J. *The Elements of Statistical Learning: Data Mining, Inference, and Prediction: Springer Series in Statistics*. 2nd ed. New York: Springer-Verlag; 2009:chap 7

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