Machine learning predicts which patients benefit from prostate multiparametric MRI

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A newly developed machine learning model can accurately predict which patients are most likely to benefit from prostate multiparametric MRI (mpMRI), according to a study to be presented at the ARRS 2018 Annual Meeting, set for April 22-27 in Washington, DC.

With mpMRI increasingly used for prostate cancer detection, this machine learning model can aid in patient selection to optimize resource utilization and reduce unnecessary costs, according to Zachary Nuffer of the University of Rochester Medical Center, who will present his findings at the ARRS 2018 Annual Meeting.

A total of 811 prostate mpMRI examinations from four tertiary care centers with mpMRI expertise were used to develop a support vector machine model for predicting PI-RADS category 4 or 5 lesions on the basis of patient age, prostate specific antigen, and prostate volume. Patients either had no prior prostate biopsy or had a negative prior prostate biopsy. The model was developed on the Microsoft Azure Machine Learning platform and can be accessed at birch.azurewebsites.net. The model was then tested prospectively on 42 patients.

The model showed 73% accuracy for predicting PI-RADS category 4 or 5 lesions on the basis of 10-fold cross validation. Prospective validation of the model demonstrates a sensitivity of 75% and specificity of 82% for a cutoff threshold of 43% for predicting PI-RADS category 4 or 5 lesions.

With educational activities representing the entire spectrum of radiology, ARRS will host leading radiologists from around the world at the ARRS 2018 Annual Meeting, April 22-27, at the Marriott Wardman Park Hotel in Washington, DC. For more information, visit http://www.arrs.org/am18.

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