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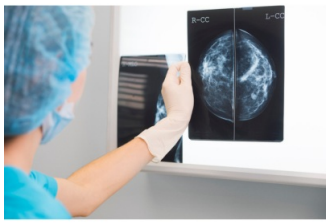
An AI Algorithm for Determining Breast Density on BI-RADS Scale



An Italian research group (Milan, Italy) recently described a fully automated artificial intelligence (AI)-system for measuring breast density in *Radiology: Artificial Intelligence*.

Breast density is a common risk factor for breast cancer because it can reduce the sensitivity of mammography screening. Density is commonly visually rated on the Breast Imaging Reporting and Data System (BI-RADS) 4-category scale, which brings issues associated with interobserver and interobserver variability. To overcome these issues, the research investigated whether an AI algorithm could address the variability. The team developed, validated, and then tested the algorithm's reliability in a clinical setting.

The AI software model, TRACE4BDensity (DeepTrace Technologies), consisted of three convolutional neural networks algorithms. The model was trained with 760 mediolateral oblique images from mammograms obtained between 2017 and 2020 from 380 women. Seven radiologists interpreted breast density in these images; three used a set of 384 images from 197 women to validate the algorithm.

According to the BI-RADS scale, the algorithm could distinguish with 89.3% accuracy A and B levels (non-dense breasts) from C and D levels (dense breasts). The levels indicate an ordinal level of density, where level A is fatty tissue and level D is extremely dense. There was 90.4% agreement with the three validating radiologists on the validation image set, with a reliability of 0.807 (Cohen's κ).

Senior author Prof Francesco Sardanelli wrote: 'Distinguishing dense from nondense breasts is indeed the clinically most relevant task and may drive the potential referral to supplemental screening' and concluded that 'this result offers a robust way to overcome the variability of human visual assessment.'

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Source: Radiology: Artificial Intelligence

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