Deep-learning method creates super-resolution mammo images

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Thursday, November 30 | 12:15 p.m.-12:45 p.m. | PH257-SD-THA3 | Lakeside, PH Community, Station 3
In this poster presentation, Japanese researchers will present a deep-learning technique that enhances mammography results to create super-resolution images.

The researchers, led by Junko Ota from Osaka University in Suita, started with more than 700 cases with breast masses from the Digital Database for Screening Mammography (DDSM). The collection included mediolateral oblique images and craniocaudal views of the breast.

They then used a state-of-the-art deep-learning technique known as the super-resolution convolutional neural network (SR-CNN), which is trained with millions of natural nonmedical images.

Using the SR-CNN, Ota and colleagues created high-resolution images from low-resolution mammograms. Peak signal-to-noise ratios and structural similarity were then measured to assess image noise levels and perceived image quality.

A quantitative analysis showed that the SR-CNN method achieved significantly greater mean standard deviations for peak signal-to-noise ratio and structural similarity than conventional techniques. This indicates that the approach can significantly outperform conventional interpolation methods for enhancing image resolution in digital mammography, according to the researchers.

"The expected clinical benefits and implications for patients are that a deep learning-based super-resolution scheme has potential to replace magnification mammography without any additional dose exposure or patient nuisance," Ota told *AuntMinnie.com*.

This paper received a Roadie 2017 award for the most popular abstract by page views in this Road to RSNA section.