Computer-Aided Diagnosis for Breast Ultrasound

Samsung Applies Deep Learning from Big Data in World-First

The Samsung RS80A with Prestige premium ultrasound device now includes S-Detect™, which applies deep learning to breast lesion analysis using ultrasound.

Background

Breast ultrasound can be hard to read and interpret and the reader may experience fatigue and attention lapses. Computer-aided diagnosis (CADx) is a tool that can assist the radiologist to interpret ultrasound images.

Samsung's Advanced Institute of Technology has therefore created an algorithm that can be run on each individual RS80A with Prestige ultrasound device. The algorithm is based on deep learning from an independently acquired anonymous set of real-life data.

Principal engineers Yeong Kyeong Seong, PhD and Moon Ho Park, PhD explained that Samsung partnered with medical institutes and doctors to assemble a database of 10,000+ anonymous breast ultrasound images of patients who agreed to participate.

How it Works

By simply clicking a suspicious lesion, S-Detect™ draws the lesion borders, suggests the characteristics of the lesion and gives a recommendation on whether the lesion is benign or malignant, based on the deep learning

detection algorithm.

S-Detect™ includes 3 modes, so that users can set the level of sensitivity and specificity for a specific purpose.

S-Detect™ employs the American College of Radiology's Breast Imaging-Reporting and Data System (BI-RADS®) scores for standardized reporting and classification of suspicious lesions.

All the information is integrated into a single report. This technology assists in a more accurate diagnosis, while improving the efficiency of workflow and reducing the time users spend in repetitive tasks.

Samsung's S-Detect for Breast equips physicians with the confidence that Samsung's latest technologies brings to enable them to make better decisions and final diagnosis faster.

"We saw a high level of conformity from analyzing and detecting lesions in various cases by using the S-Detect. Users can reduce taking unnecessary biopsies and doctors-in-training will likely have more reliable support in accurately detecting malignant and suspicious lesions" – Prof. Han Boo Kyung, Samsung Medical Center

Enhancements

Other imaging enhancements and diagnostic functions in the RS80A with Prestige include fusion and contrast-enhanced ultrasound imaging.

S-Fusion — Now provides 'Respiration Auto' function that minimizes the registration gap between real-time ultrasound and recorded CT/MRI images, which is caused by the difference in images when the patient inhales and exhales.

CEUS+ — Applies Samsung's 'VesselMax' and 'FlowMax' to generate clear visualization of vessels and blood flow when viewing ultrasound images with contrast agents.

S-3D Arterial Analysis — Enables 3D imaging of vessels and provides volume measurement of artery plaque in a simplified way. Users can also track the morphological changes of the artery.

Advanced Display Technology

S-Harmonic — Generates greater image conformity from near to far field while reducing signal noise based on wider bandwidths and higher frequency.

HQ Vision — Visualizes anatomical structures with improved clarity. It helps make a reliable diagnosis especially for MSK (Musculoskeletal) imaging such as tendon and muscles.
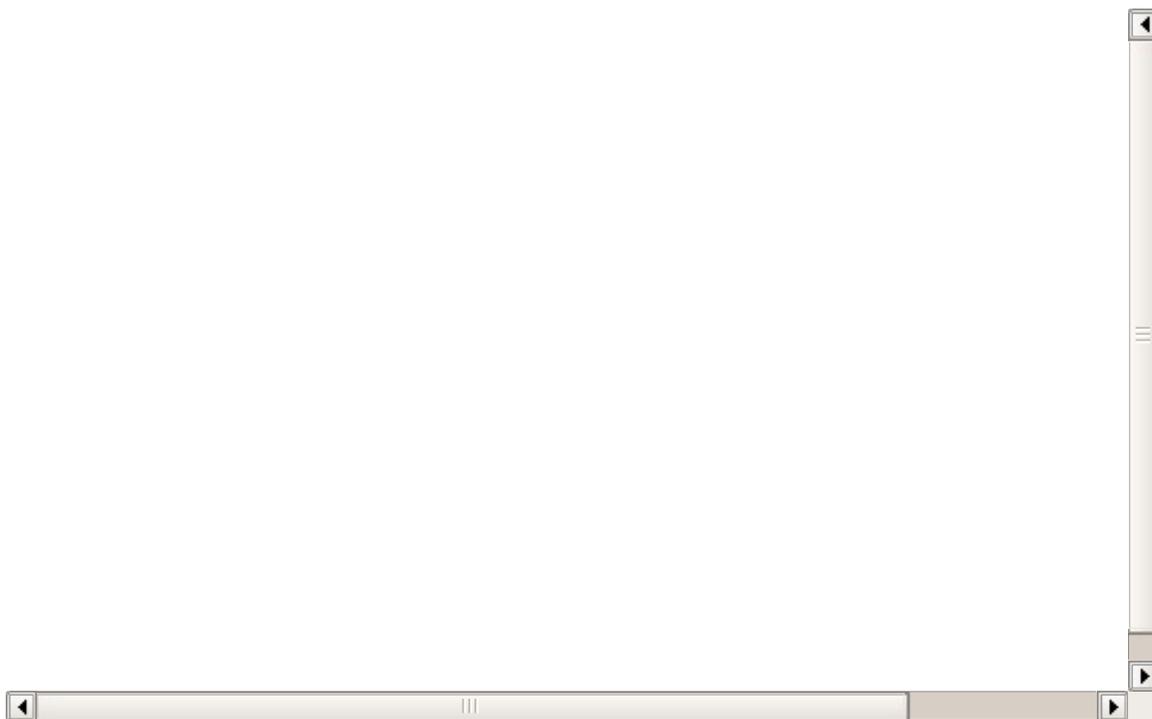
Further Information

For more information on RS80A with Prestige please visit the [Samsung website](#).

Key Points

- Provides standardization for breast mass characterization according to BI-RADS®
- Quantitative evaluation for timely management
- Offers 2nd opinion for less experienced radiologists
- Reduce unnecessary biopsies
- Ultrasound has better sensitivity for detecting invasive cancer in dense breasts
- No ionizing radiation
- Timesaving
- Seamless integration into workflow

S-Detect RS80A

Published on : Sat, 23 Jul 2016