About 1 in 8 women will get breast cancer during her life, which make the disease the most common cancer among women in North America. It is formed by an abnormal division of ducts and lobules that change the structure of the breast and produce a tumour. Factors such as nuclear to cytoplasm ratio, differentiation ability and cell pleomorphic, etc are used to classify tutors in two category of benign or malignant.

Timely diagnosis of the disease is crucial in decreasing its mortality rate.

One of the common challenges that arises in screening is the density of the breast tissue. On a mammogram, non-dense breast tissue appears dark and transparent, whereas, dense breast tissue appears as a solid white area, which causes a 30% decrease in sensitivity of mammograms.

About half of women undergoing mammography have dense breasts. Having dense breasts increases the chance that breast cancer may go undetected by a mammogram, since dense breast tissue can mask a potential cancer. The most promising screening approach in case of dense breasts has clinically proven to be the ultrasound imaging.

Ultrasound has other great advantages such as, no ionizing radiation, real-time examination, relative affordability, especially in comparison with MRI.

However, ultrasounds are generally accompanied by FNA’s (fine needle aspiration) when imaging shows an abnormal growth or area. A procedure that’s invasive, and in case of tumour heterogeneity, it only collects inconclusive information. This study is done to overcome the shortages of ultrasound/biopsy screening by objectively analyzing noninvasive ultrasound images.

- Chiao, Jui-Ying, et al. "Detection and classification the breast tumours using mask

R-CNN on sonograms." Medicine 98.19 (2019).

* <https://cancer.ca/en/cancer-information/cancer-types/breast/statistics>
* - <https://www.mayoclinic.org/tests-procedures/mammogram/in-depth/dense-breast-tissue/art-20123968>
* <https://cancer.ca/en/treatments/tests-and-procedures/fine-needle-aspiration-fna>

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