Abstract Submitted
for the TSS21 Meeting of
The American Physical Society

Deep Learning Model for Mass Classification in Mammograms Using Artificial Multi-Channel Inputs To Enhance Accuracy[1] IVAN VAZQUEZ, NATHANIEL R. FREDETTE, MD Anderson Cancer Center — Breast cancer isresponsiblefor approximately 30,000 deaths annually in the US and remains a leading cause of cancer-related death among women.Early and accurate diagnosis increases the chances of survival, with mammography as the primary screening method.Some automated detection tools, like computer-aided diagnosis (CAD) systems, have proven invaluable to find early traces of the disease.However, detection and characterization of masses in mammograms remain tedious and error-pronetasks.Recently, some deep learning (DL) models trained to detect cancerous growth in mammograms have shown performances exceeding that of traditional CAD systems and evenradiologists.Yet, most DL models used were designed for multi-channeled color inputs, and typically a single mammogram is repeated for each of the input channels. We propose a method that uses extracted image features as artificial input channels to train the model. We investigate 12 attributes to reveal the best performing set of three. We trained the Xception model using a large open- source mammography dataset. Since this model relies on cross-channel correlations to make predictions, differences in performance will help us understand the benefits of our approach.

[1]Deep Learning Model for Mass Classification in Mammograms Using Artificial Multi-Channel Inputs To Enhance Accuracy

Ivan Vazquez
MD Anderson Cancer Center

Date submitted: 22 Mar 2021 Electronic form version 1.4