INTRODUCTION
According to the World Health Organization projections, breast cancer caused 559,000 deaths worldwide in the year 2008. The incidence rate of breast cancer is increasing rapidly in developing countries. India being under the radar of high incidence, there was an ardent need to work on this area with cutting edge deep learning approaches.

Fine needle aspiration cytology (FNAC) entails using a narrow gauge (25-22G) needle to collect a sample of a lesion for microscopic examination. It allows a minimally invasive, rapid diagnosis of tissue but does not preserve its histological architecture. FNAC is commonly used for diagnosis of breast cancer, with traditional practice being based on the subjective visual assessment of the breast cytopathology cell samples under a microscope to evaluate the state of various cytological features.

Steps Undertaken
- Images of FNAC breast cell samples – Benign and Malignant is captured with a digital microscope.
- Images are Augmented and cleansed. A dataset comprising of 2120 images (990 Benign and 1130 Malignant) is formed.
- Images are segmented for better ROI concentration.
- Using Transfer Learning, various CNN models are retrained.
- Models are compared after training and testing.
- GoogLeNet-V3 stands out as the best model.

RESULT
Turns out GoogLeNet-V3 (fine tuned) achieves the smear level classification accuracy of 96.25% better than VGG16, VGG19, ResNet50 and GoogLeNet-V1. Achieving state of the art accuracy helps in better detection of cancerous cells and thus leading to better diagnosis of breast cancer.

Better CNN models will make the cut, achieving human level perception. More data and careful tuning of the hyperparameters will make the way for a better human society decreasing the death count to a huge extent.

ABOUT
This poster presents a comparison of various deep convolutional neural network (CNN) based fine-tuned transfer learned classification approach for the diagnosis of the FNAC cell samples into Malignant or Benign.