Deep Learning to Improve Breast Cancer Detection on Screening Mammography - A summary

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Outline

Problem Description

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- Breast cancer second leading form of cancer among U.S women
- Advent of AI in bio-sciences better predictions of screening mammograms using deep learning
- Two obstacles hindering further progress
  - Heterogeneous databases
  - Tumors only occupy small region of mammograms

Model and Training

Model Structure

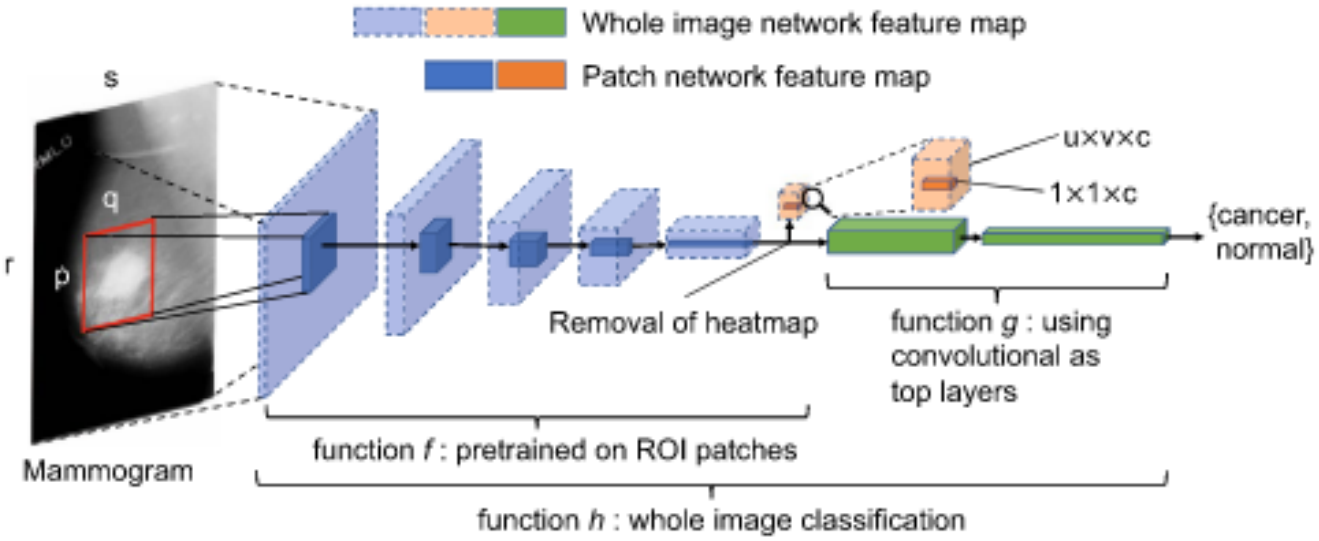

Figure: Illustration of the pipeline structure [SMR+19]

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- SBIS-DDSM containing annotated ROIs
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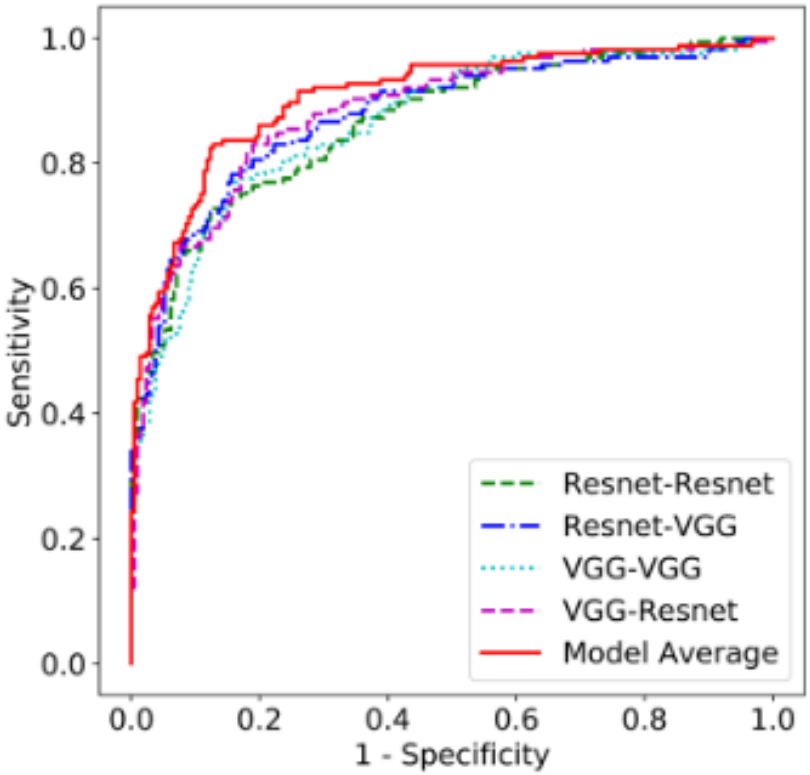

Training and Results II

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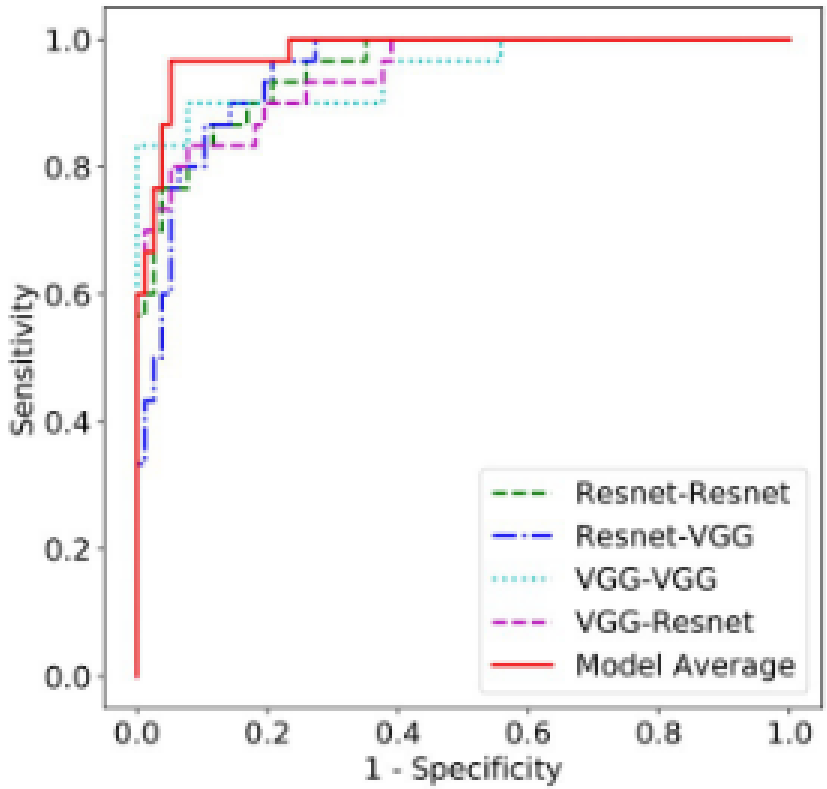
- Use pre-trained patch classifier from previous training set
- Good results after few images already: Intensive part lies in fine-tuning patch classifier



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- End-to-end learnable deep learning approach
- Great versatility due to pipeline structure
- Still doesn't overcome reliance on labelled ROIs to further increase performance


Li Shen, Laurie Margolies, Joseph Rothstein, Eugene Fluder, Russell McBride, and Weiva Sieh.
Deep learning to improve breast cancer detection on screening mammography.
Scientific Reports, 9:1–12, 08 2019.