Skin Lesion Image Analysis For Melanoma Detection

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Melanoma

- Over 160,000 newly diagnosed cases in the United States this year
- One person dies of melanoma every hour
- About $3.3 billion dollars spent annually to treat melanoma

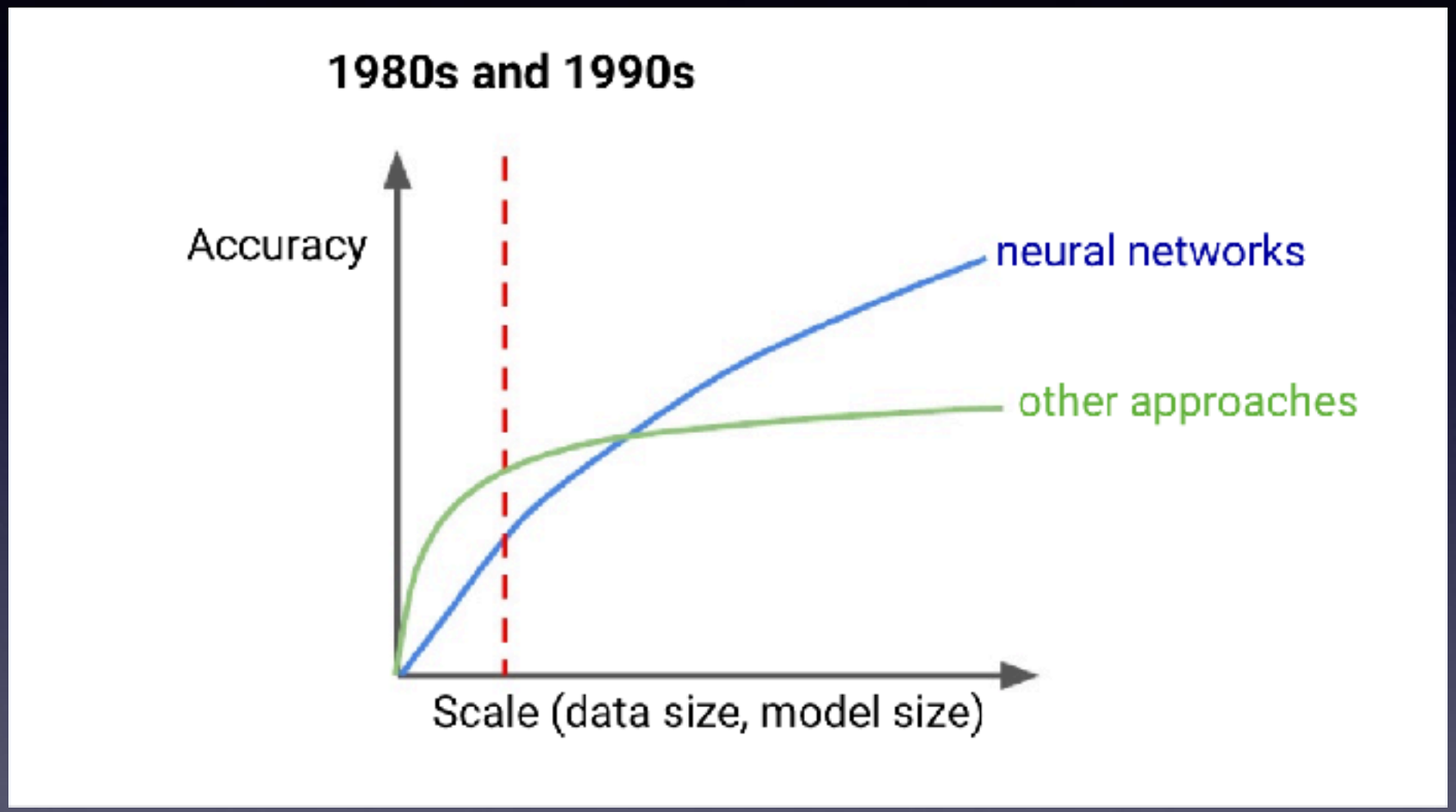
- source: http://www.skincancer.org/skin-cancer-information/skin-cancer-facts

Melanoma

- 5-year survival is over 98% if detected early
- Can be detected by expert visual inspection
- It can also be detected with automated image analysis

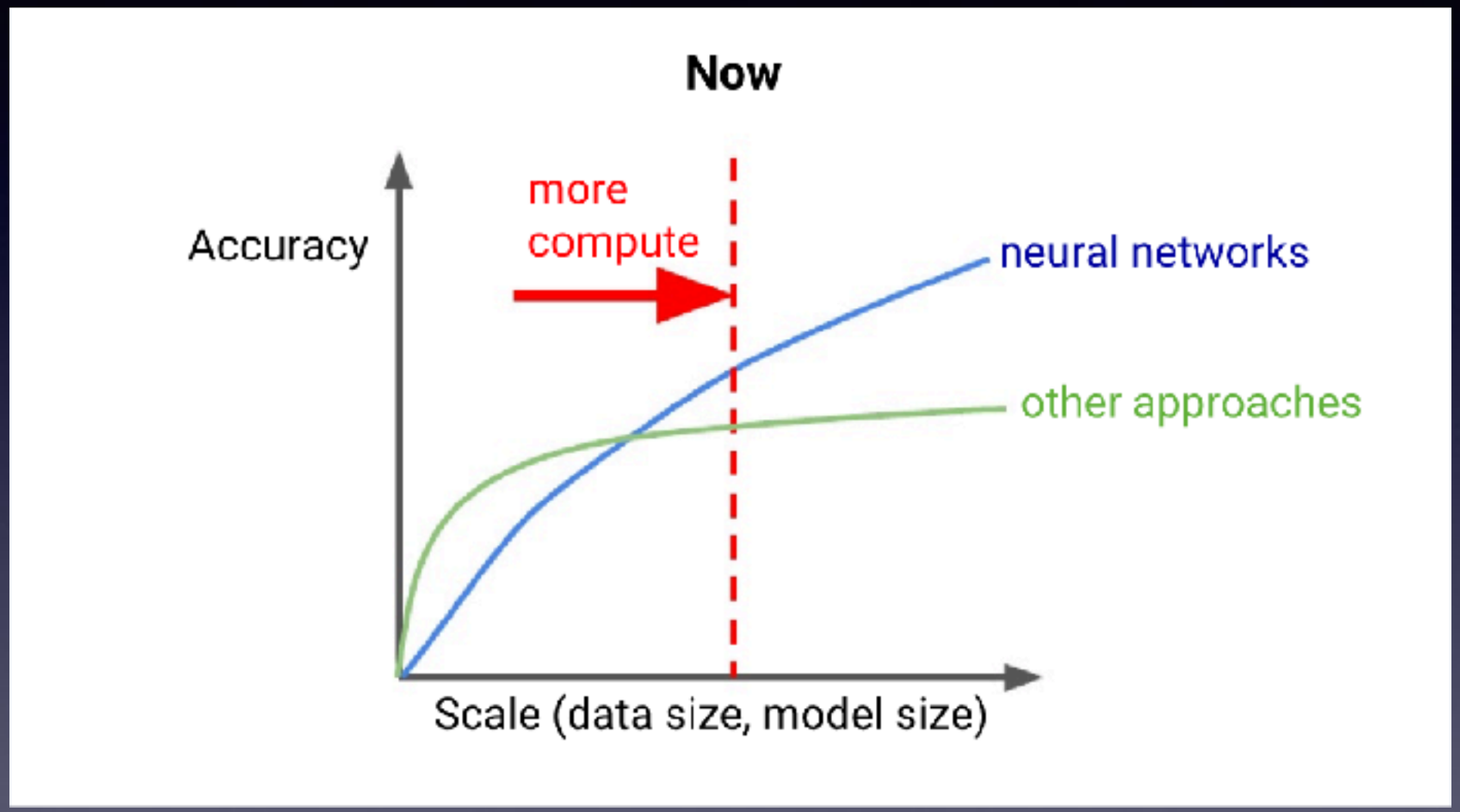
- source : www.cancer.net/cancer-types/melanoma/statistics

Why Deep Learning?



- source: http://blog.ycombinator.com/jeff-deans-lecture-for-yc-ai/

Why Deep Learning?



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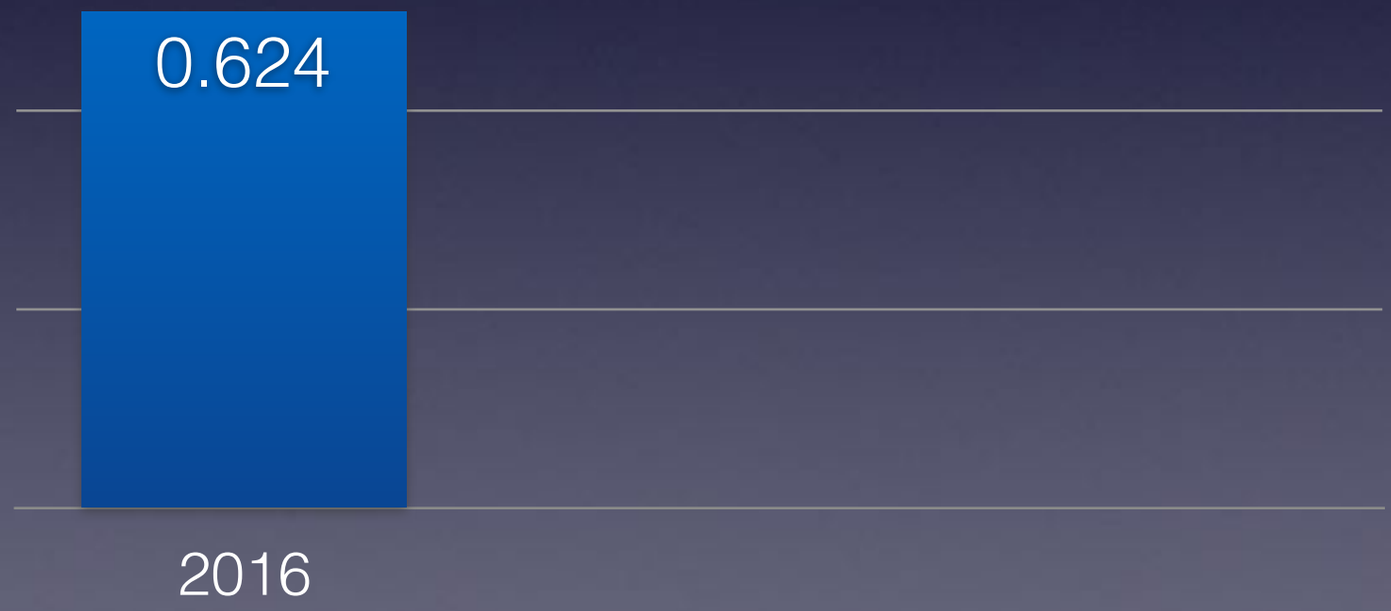
Melanoma Dataset

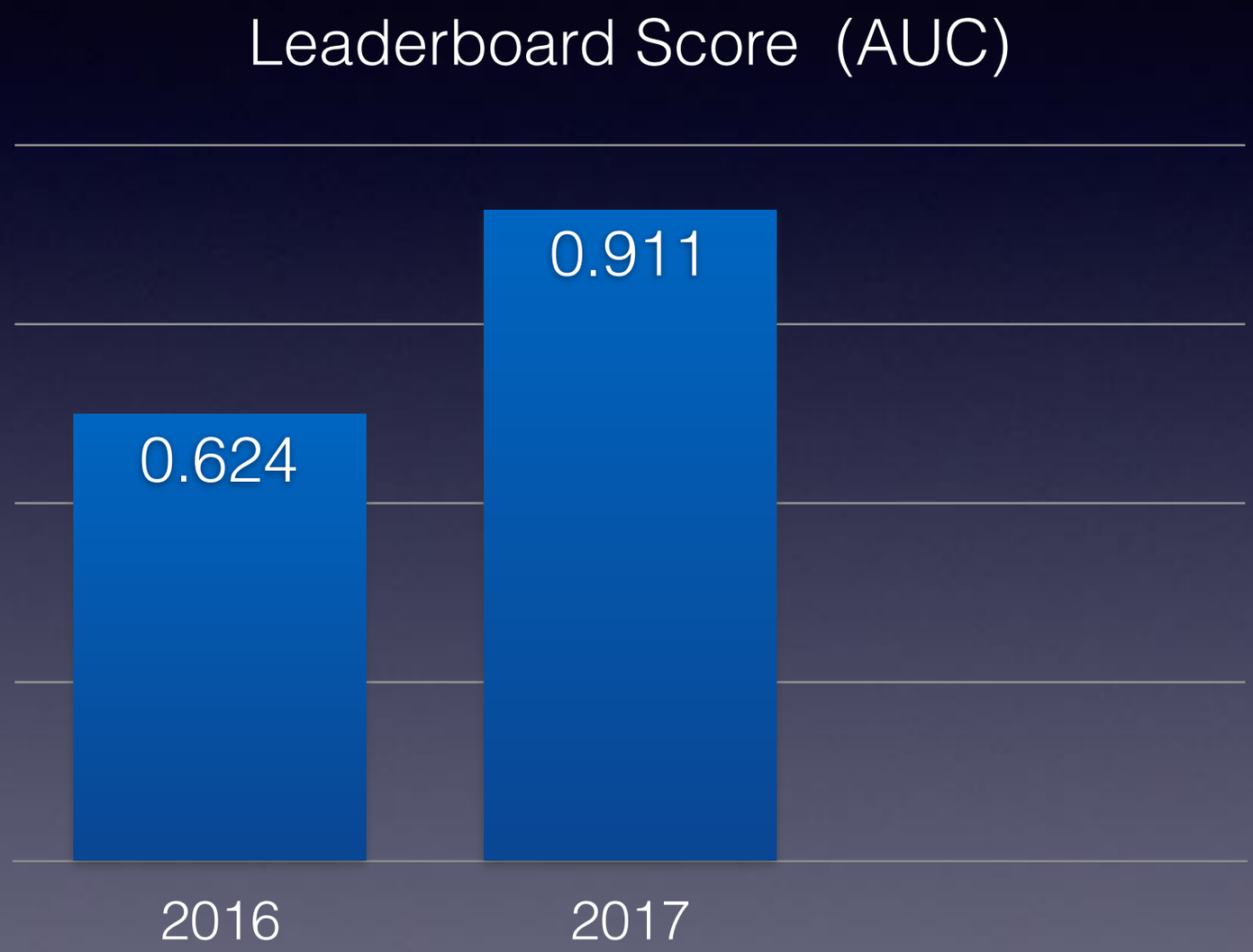
- ISIC Archive: International Skin Imaging Collaboration
- Over 3600 images for training set and 600 for test set

ISIC Competition Results

Leaderboard Score (AUC)

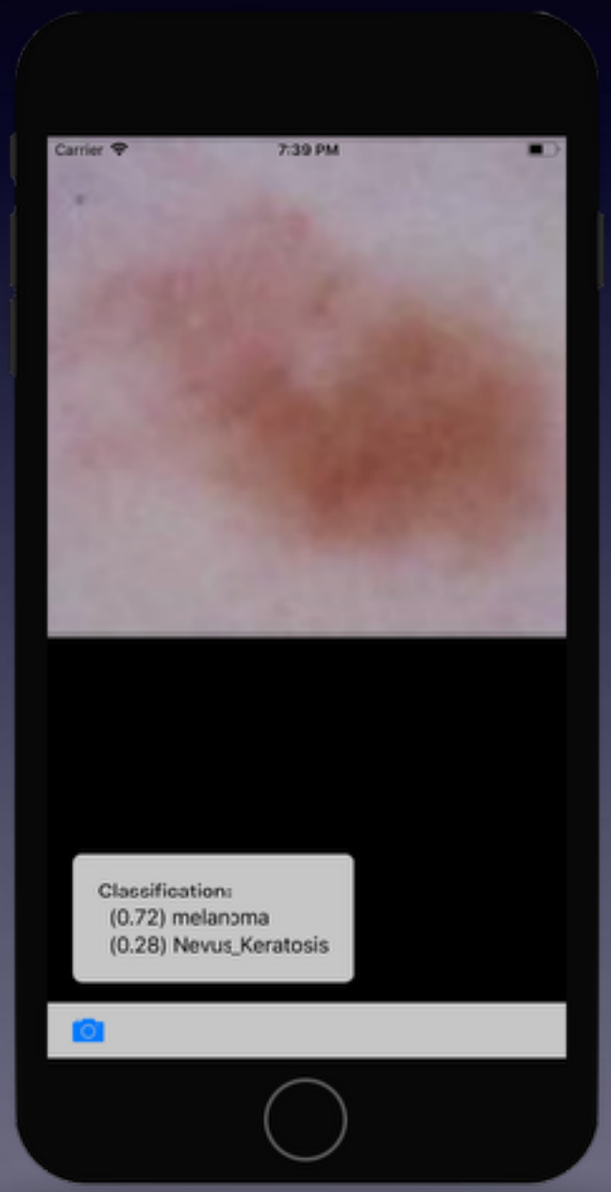


ISIC Competition Results

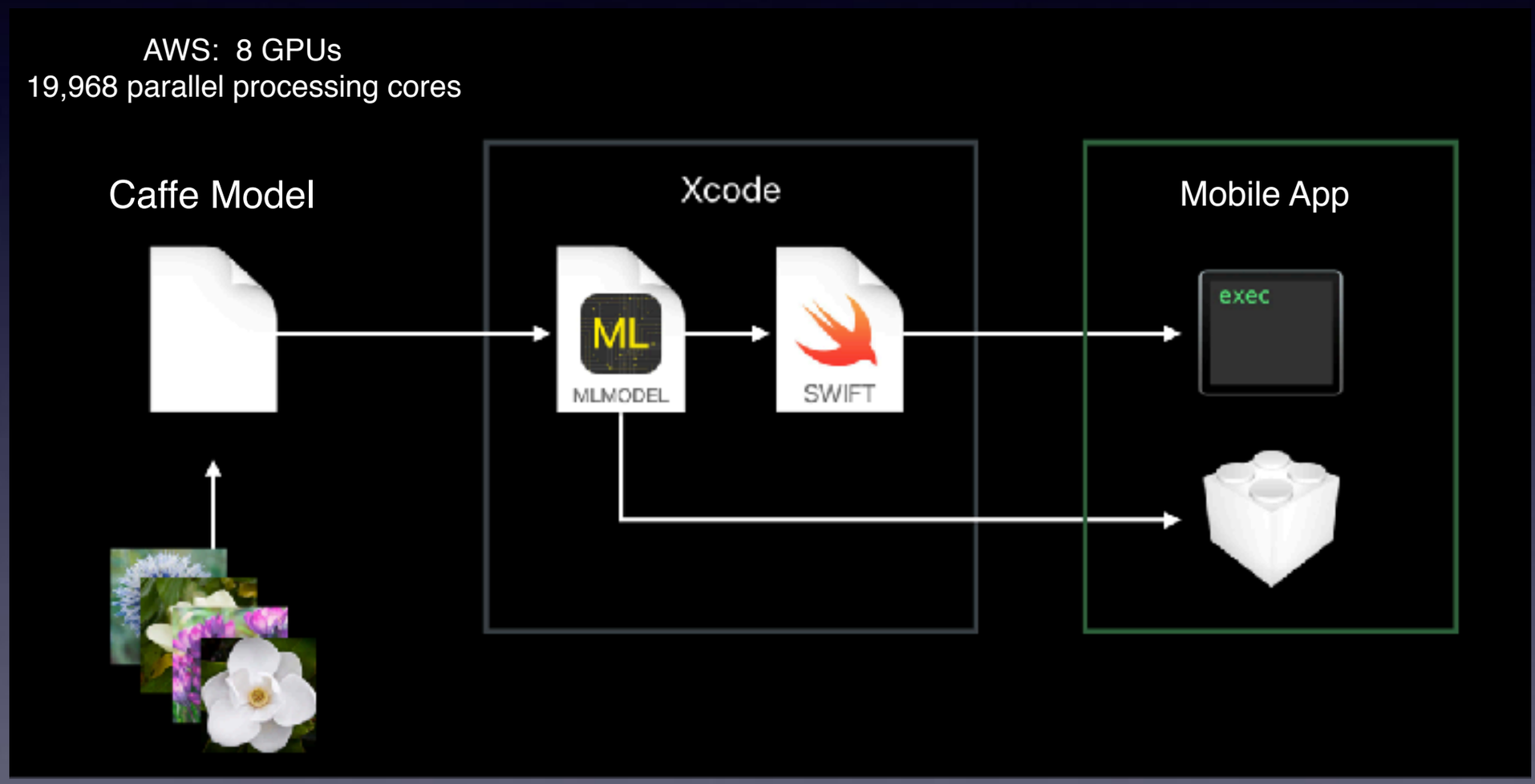


ISIC Competition Results

iOS App

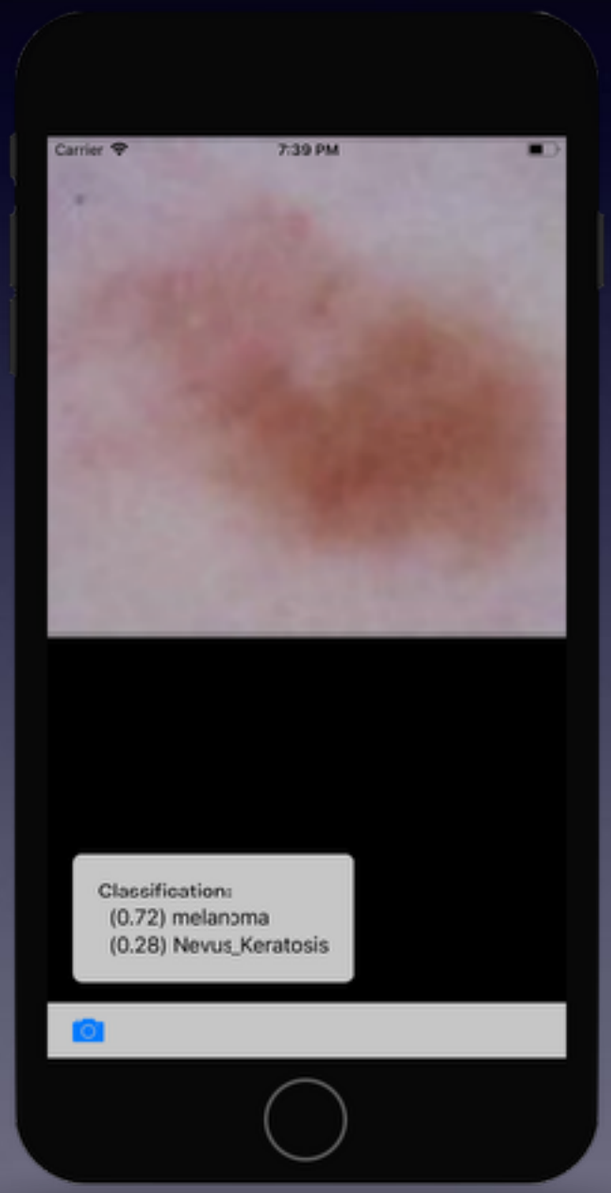

Carrier
7:39 PM
Classification:
(0.72) melanoma
(0.28) Nevus_Keratosis

Mobile App
Apple's CoreML, iOS11



- source: WWDC 2017, Core ML in depth

Demo


Carrier
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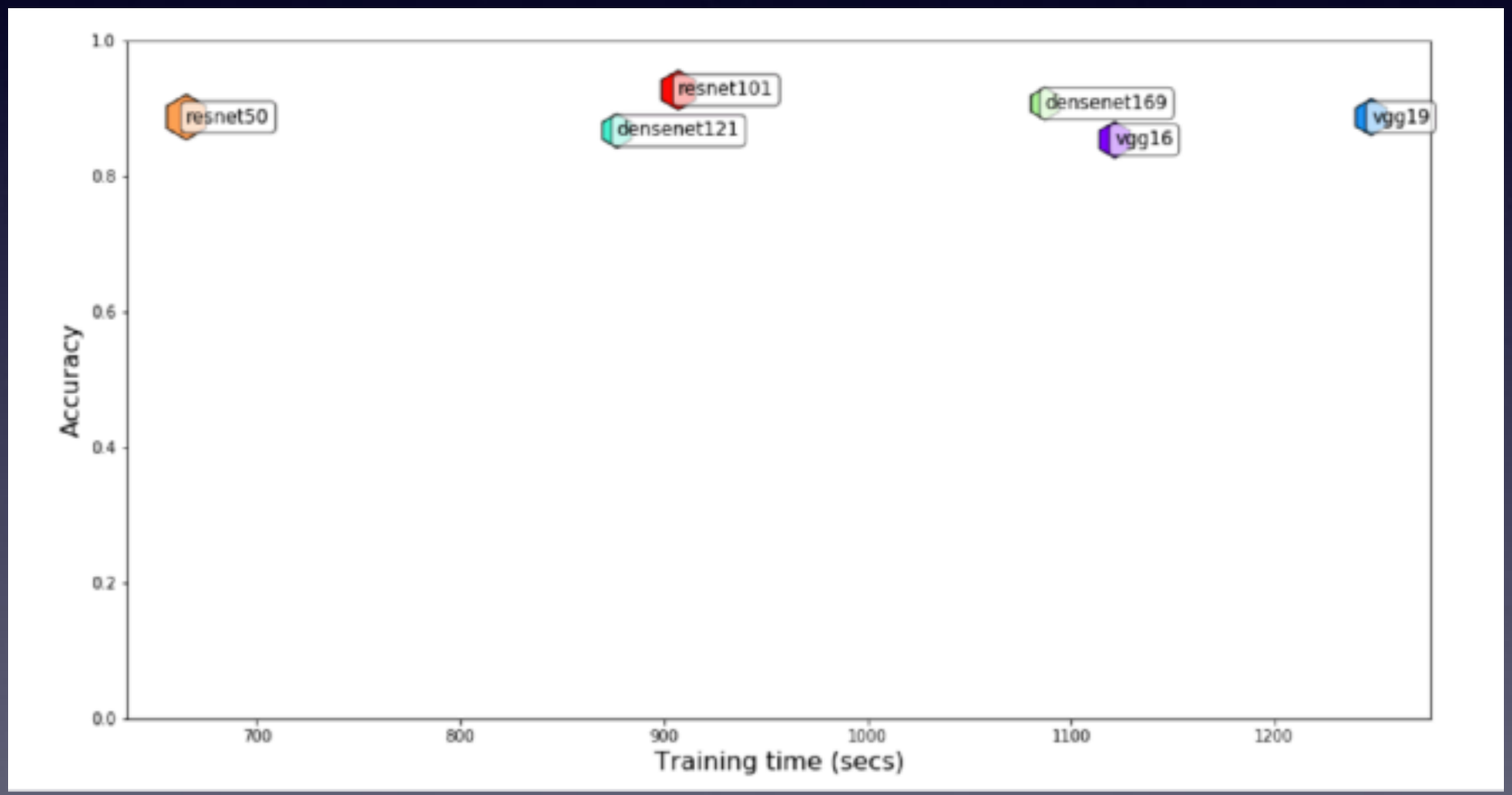
- Additional Slides

Model Exploration



Deployment-Caffe, Nvidia DIGITS

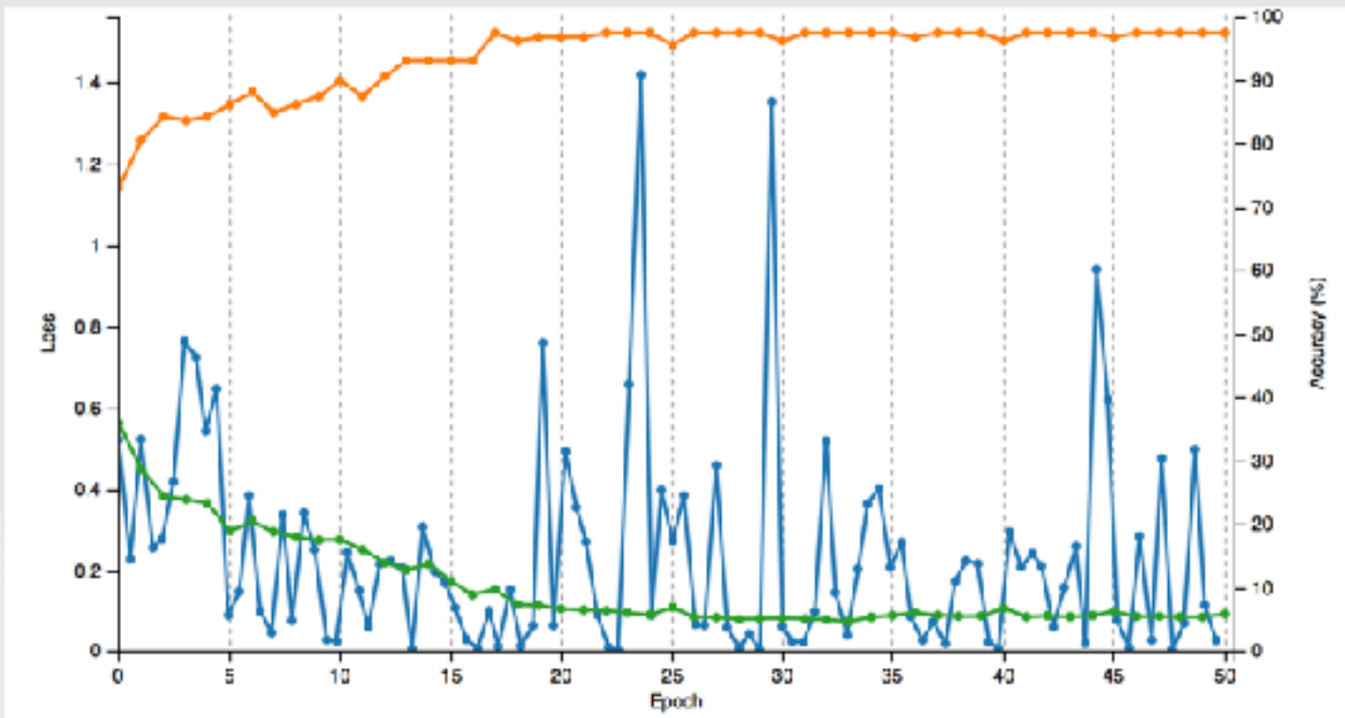
Disk Size
10.8 GB
Network (train/val)
train_val.prototxt
Network (deploy)
deploy.prototxt
Solver
solver.prototxt
Raw caffe output
caffe_output.log
Pretrained Model
/home/ubuntu/models/bvlc_alexnet.caffemodel

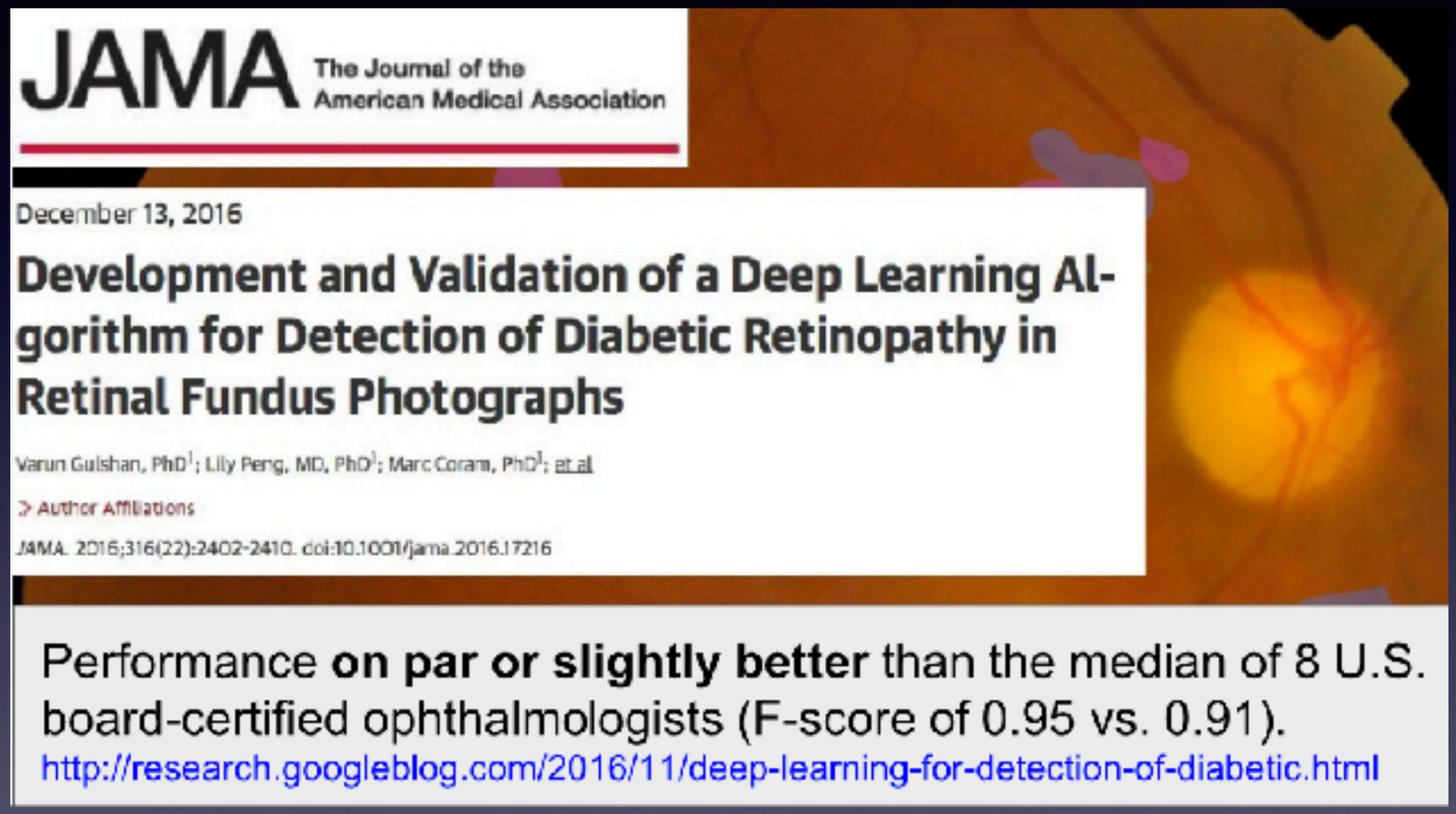
Dataset

melanoma

Done Thu Sep 28, 07:43:57 PM

Image **Size**
256x256
Image **Type**
COLOR
DB backend
lmdb
Create DB (train)
3631 images
Create DB (val)
150 images





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