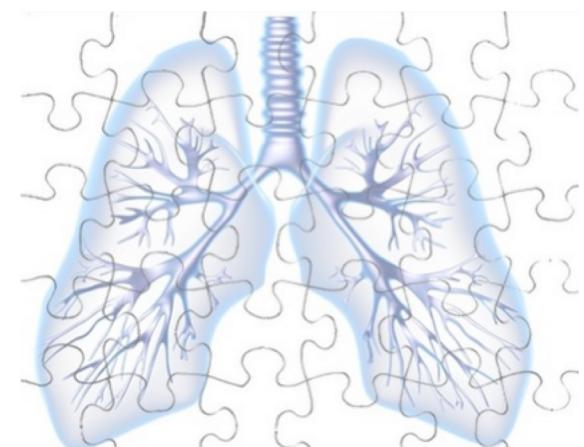


Diagnosing pneumonia

Carolina Gonzalez

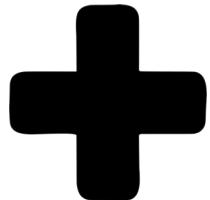
Business case

- Children's death toll.
- Expensive inpatient treatment.
- X-rays common.
- Experts shortage.

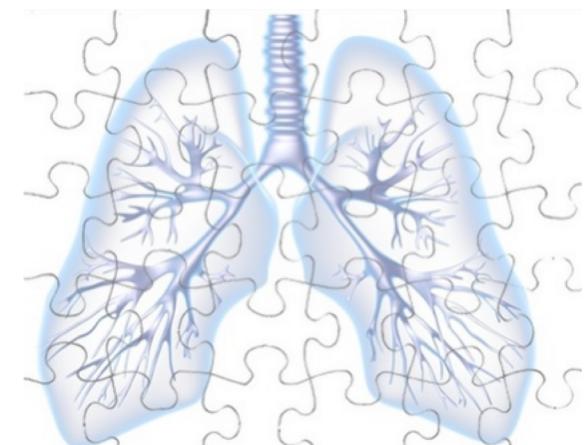


Diagnosing process

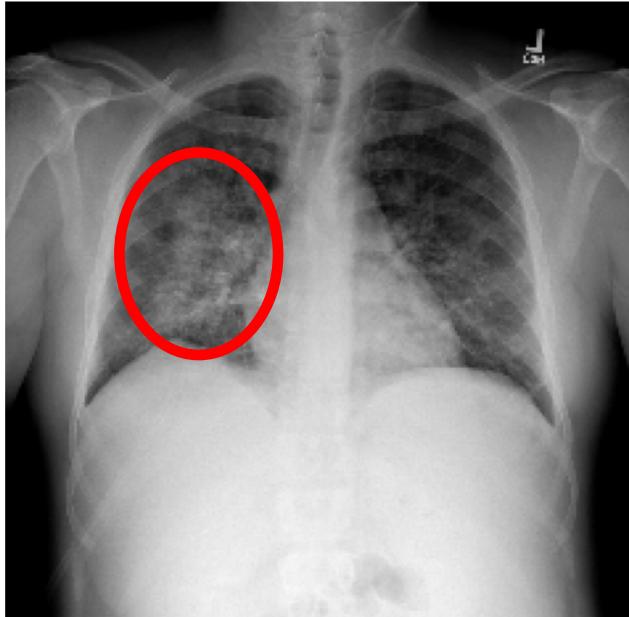
Symptoms



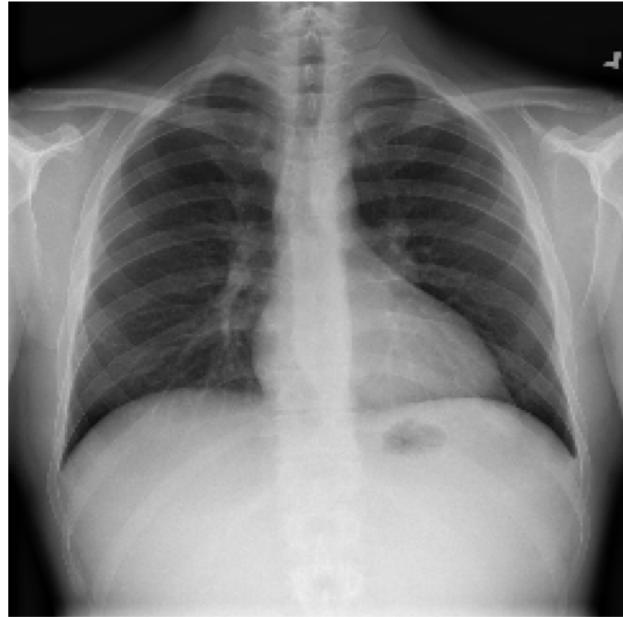
X-Rays



Data

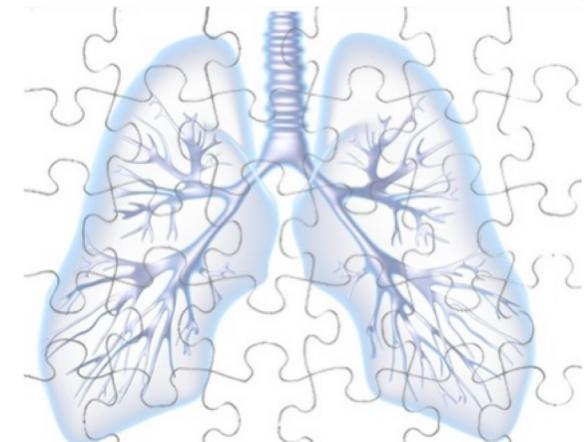


Pneumonia

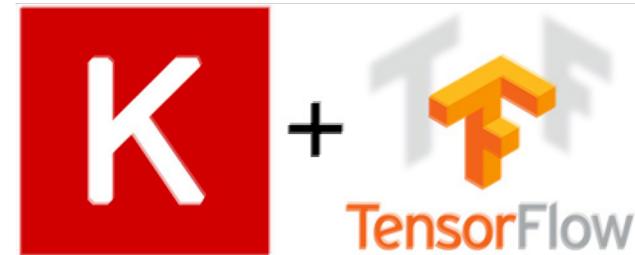
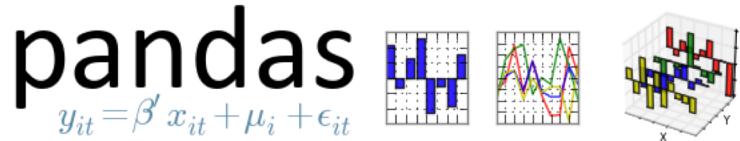
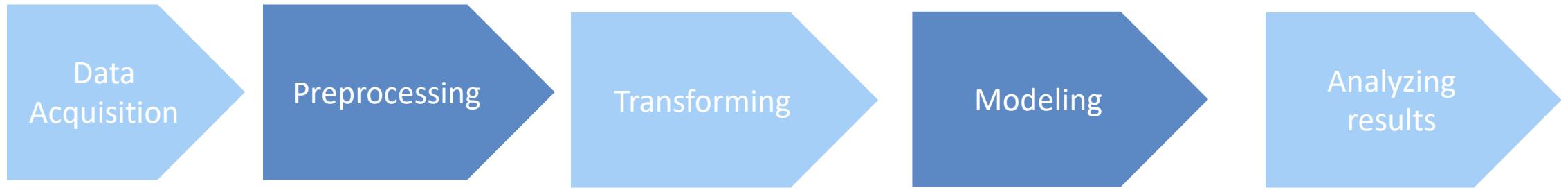


No Pneumonia

- 25000+ X-rays:
 - 78% No pneumonia
 - 22% Pneumonia



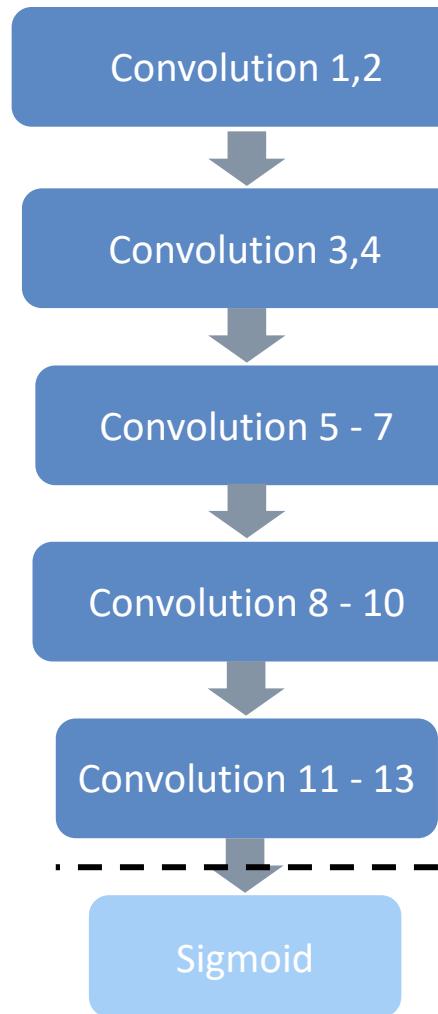
Workflow and tools



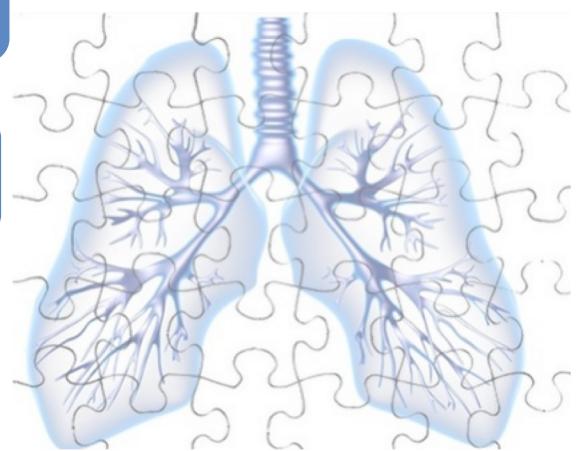
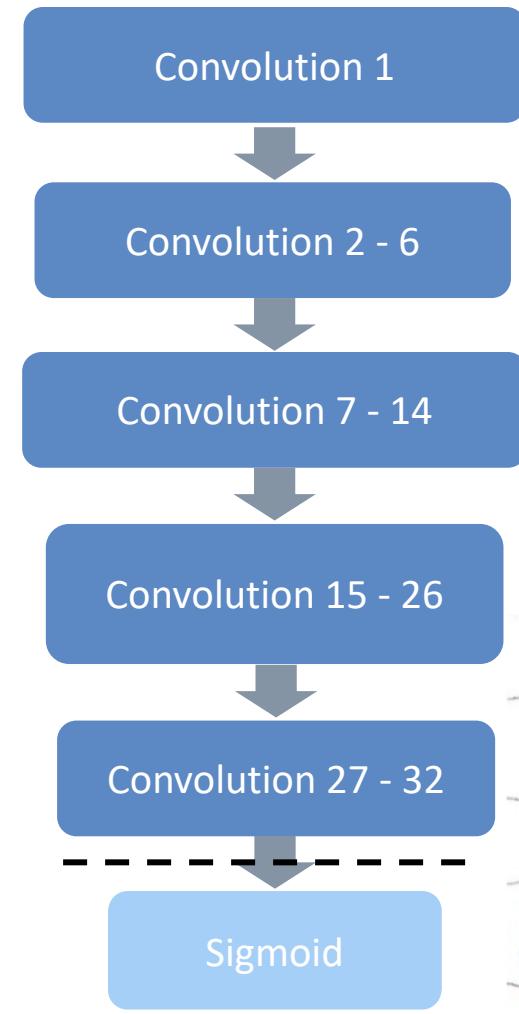
HDF5 for Python

Transfer learning architectures

VGG16

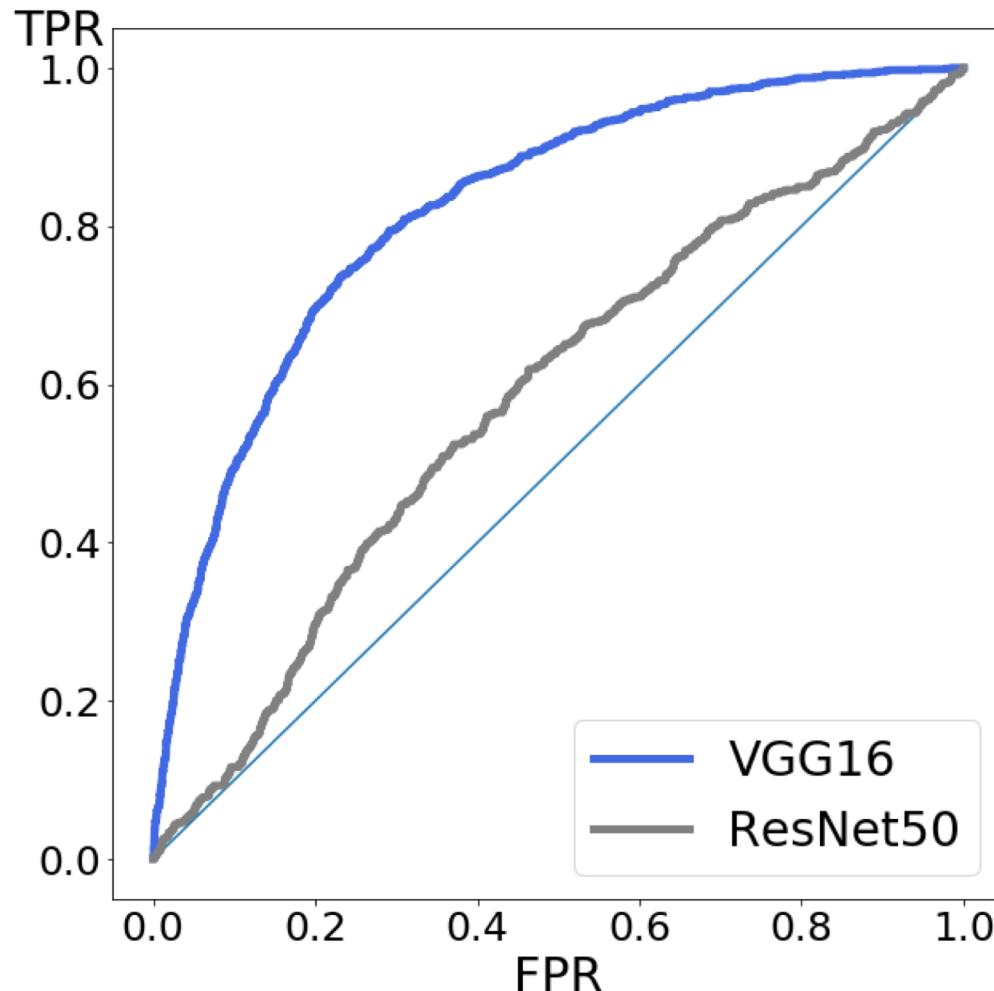


ResNet50



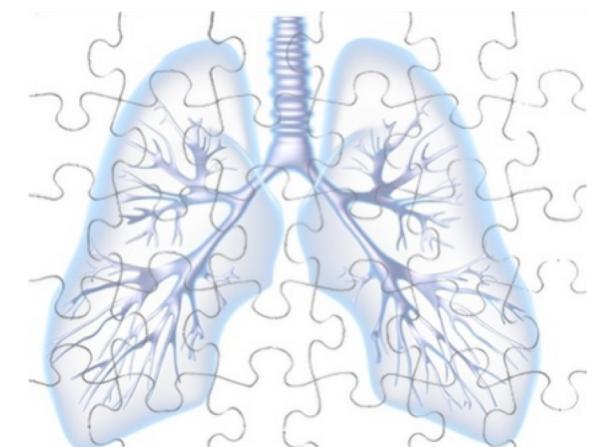
Model: neural networks transfer learning

ROC curves for main models



Modified VGG16 was selected
based on ROC AUC

Modified VGG16 ROC AUC = 0.822

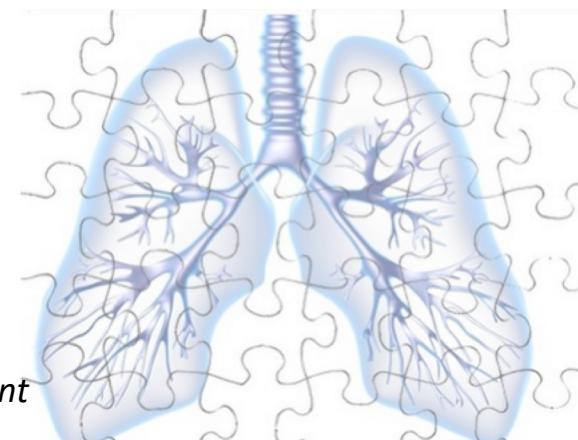


Evaluation of performance

CheXNet: Radiologist-Level Pneumonia Detection on Chest X-Rays with Deep Learning

Pranav Rajpurkar *¹ Jeremy Irvin *¹ Kaylie Zhu¹ Brandon Yang¹ Hershel Mehta¹
Tony Duan¹ Daisy Ding¹ Aarti Bagul¹ Robyn L. Ball² Curtis Langlotz³ Katie Shpanskaya³
Matthew P. Lungren³ Andrew Y. Ng¹

Reviewer	F1 Score
Radiologist 1	0.383
Radiologist 2	0.356
Radiologist 3	0.365
Radiologist 4	0.442
Radiologist avg.	0.387
Model	0.573



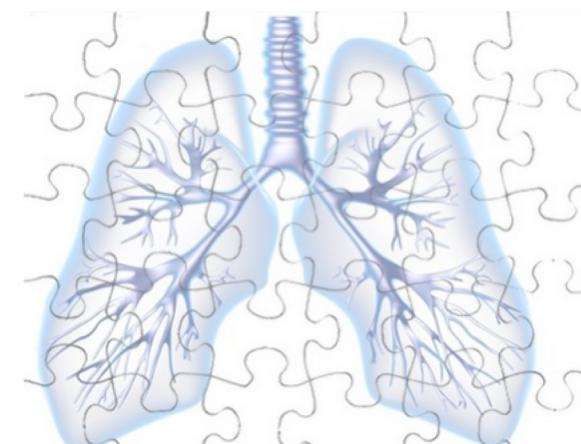
Ref: Rajpurkar, Pranav, et al. "CheXnet: Radiologist-level pneumonia detection on chest x-rays with deep learning." *arXiv preprint arXiv:1711.05225* (2017).

Conclusions

- The model diagnosed pneumonia.
- Improvement in performance.

Future work

- Inclusion of metadata.



Thank you



m_carolina_g@yahoo.com



mcarolinag



carolinagonzalezseattle



mcarolinag.github.io

