# NLP Presentation Script

## Background

### Chest X-ray definition & why they help

One of most common imaging procedures in medicine, accounting for 40% of all diagnostic imaging.

Chest X-rays produce images of our heart, lungs, blood vessels, airways, and the bones of our chest and spine. These images help doctors determine whether a patient has heart problems, a collapsed lung, pneumonia, broken ribs, emphysema, cancer or any of several other conditions. A chest X-ray is often among the first procedures that a patient undergoes when a doctor suspects any disease. Related to heart or lung.

CXR are normally obtained by a certified technologist and the images sent for interpretation by a radiologist, who is a physician with specialized training in medical imaging.

## Problem

Nowadays, radiologists read from large queue’s which are prioritized by location/clinical status of the patient, e.g. Immediate, ED/Acute, ICU, Inpatient, Outpatient urgent, Outpatient today, Inpatient, Outpatient routine etc. however, often unexpected findings come up in low priority cases. Often there is a backlog of exams which further increases time to interpretation. Turn-around-time (TAT) is currently used by hospital systems and oversite organizations a quality-of-care metric.

To minimize the time it takes for emergent findings to be communicated, it would be great to have a tool that could triage the abnormal cases to the head of the queue to be read first by a radiologist.

The mix of normal to abnormal cases obviously varies; however, some studies have estimated that over 60% of CXR’s are interpreted as normal. If the abnormal studies could be prioritized over the normal studies, this could reduce the time for communication of potentially urgent or emergent findings in half. “Currently there are no systematic and automated ways to triage chest X-rays and bring those with critical and urgent findings to the top of the reporting pile”

Multiple efforts to use AI and computer vision to help triage CXR’s are underway; however, these efforts are limited by the availability of large sets of labelled data (on the order of 10’s of thousands of images). There are however an abundance of CXR images with accompanying radiology reports available through in over 6000 hospital systems throughout the U.S., numbering over 100 million exams per year. If there were a way to generate weak labels in an automated fashion from CXR reports; this would have a large impact on efforts to develop computer vision systems to triage CXR for radiologic interpretation. Such systems could be trained by large datasets as well as tailored to a particular hospital’s case spectrum and equipment; thereby increasing their value in a local setting.

## References

<https://www.rsna.org/news/2019/january/ai-for-chest-x-rays>

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Mettler FA, Radiology 2009, Radiologic and Nuclear Medicine Studies in the United States and Worldwide: Frequency, Radiation Dose, and Comparison with Other Radiation Sources—1950–2007