PNEUMONIA DETECTION WITH DEEP LEARNING

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May 25th, 2021

BACKGROUND

- Pneumonia causes inflammation of the lungs, causing alveoli to fill with fluid.
    - Decreased CO2 and O2 exchange in the blood.
- Elderly individuals and those with pre-existing conditions at greatest risk.
- COVID-19 can lead to pneumonia.

DIAGNOSTIC METHODS

- Testing and diagnosis are prophylactic.
- Several methods used
  - Molecular detection (RT-PCR) is gold standard for COVID-19
- RT-PCR can be expensive, difficult to access.
- Chest x-rays are fast, inexpensive, reliable.
  - DL assistance alleviates tediousness.

Models are fast and precise.

METHODS

- Two types of neural networks tested: Multilayer Perceptron (MLP) and Convolutional Neural Network (CNN).
- CNN is a strong model for computer image detection.
- Constructed, trained, and tested for prediction accuracy on 6000 images.

RESULTS

- MLP, at its best, was 72.5% accurate in predicting pneumonia.
- Current CNN has 85.7% accuracy with minimal error.

FUTURE WORK

- Technical approaches for model optimization.
- Broader implications for detection of other diseases, including COVID-19.

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