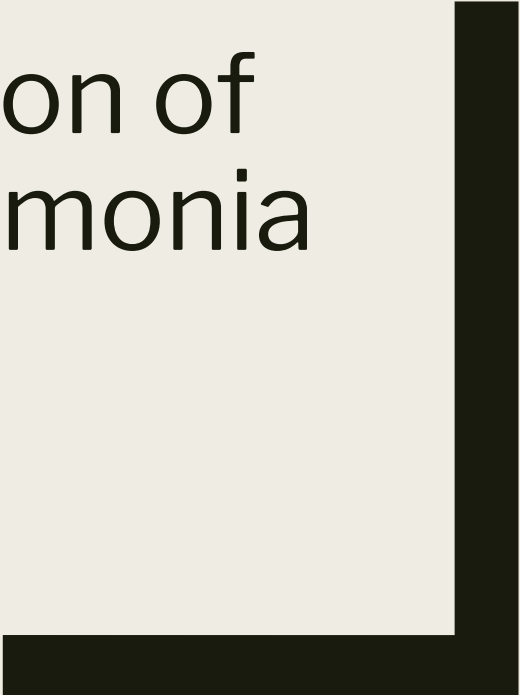




Image Classification of Patients with Pneumonia

By: Joshua Ko



Addressing the problems with the healthcare system

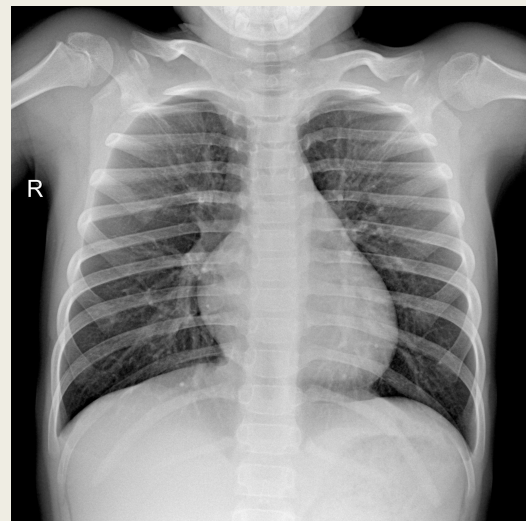
- Doctor shortage
- Burnout in healthcare workers
- Poor relationships with patients and doctors

Artificial intelligence in medicine

- Create a highly trained model to help with diagnosis
- Help address the issue of doctor shortages
- May provide a more accurate result

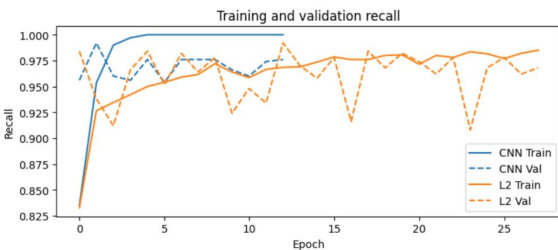
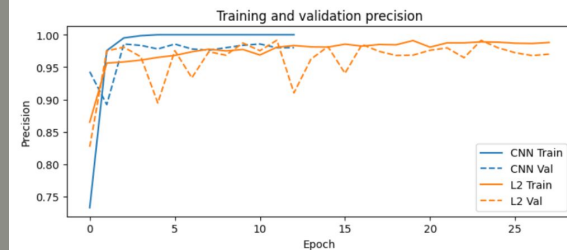
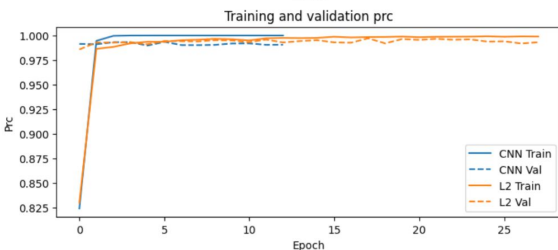
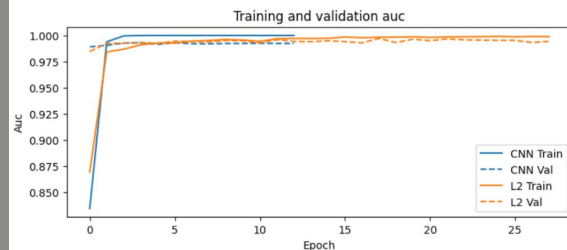
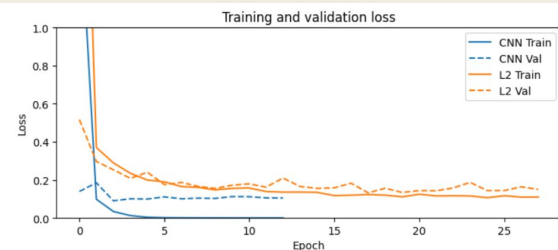
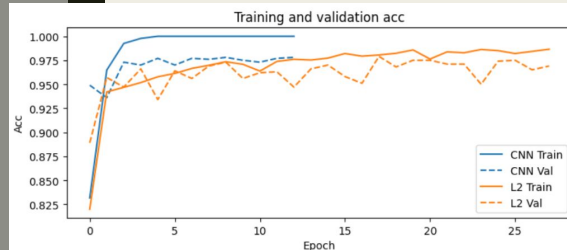
About the data

- Data provided by Mendeley Data
 - *Contains two folders:*
 - Train
 - Test
 - *Two classes in each folder:*
 - NORMAL
 - PNEUMONIA
- X-ray images of the chest as shown
 - *Top: normal lung*
 - *Bottom: lung with pneumonia*



Method of developing the deep learning model

- Start simple and add complexity
- Add regressions to prevent overfitting
- Plot metrics vs. epoch



Summary of the model

Model: "sequential_2"

Layer (type)	Output Shape	Param #
conv2d_1 (Conv2D)	(None, 254, 254, 64)	1792
max_pooling2d_1 (MaxPooling 2D)	(None, 127, 127, 64)	0
flatten_2 (Flatten)	(None, 1032256)	0
dense_4 (Dense)	(None, 64)	66064448
dense_5 (Dense)	(None, 1)	65

Total params: 66,066,305

Trainable params: 66,066,305

Non-trainable params: 0

Results of the model

Precision	0.78125
Recall	0.9615384615384616
Accuracy	0.8076923076923077
F1	0.8620689655172413

Summary

- AI has the ability to perform just as well as physicians
 - [Artificial Intelligence Versus Clinicians in Disease Diagnosis](#)
- Improve treatments
 - *Provide more accurate diagnosis*
 - *Train inexperienced doctors*
- Assists doctors
 - *Lessen the workload of doctors*
 - *Allow doctors to treat more patients*

Thank you!

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