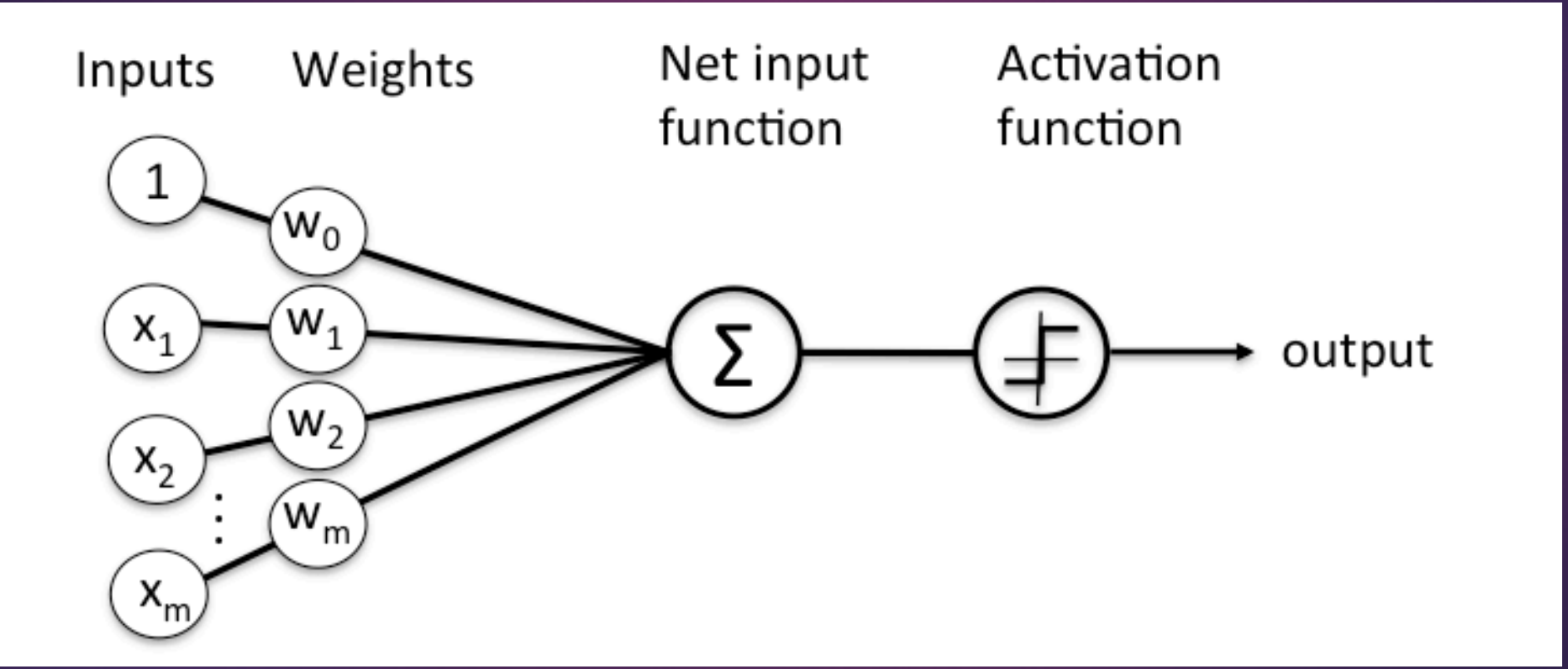
“Eliminating artefacts in polarimetric images using deep learning”

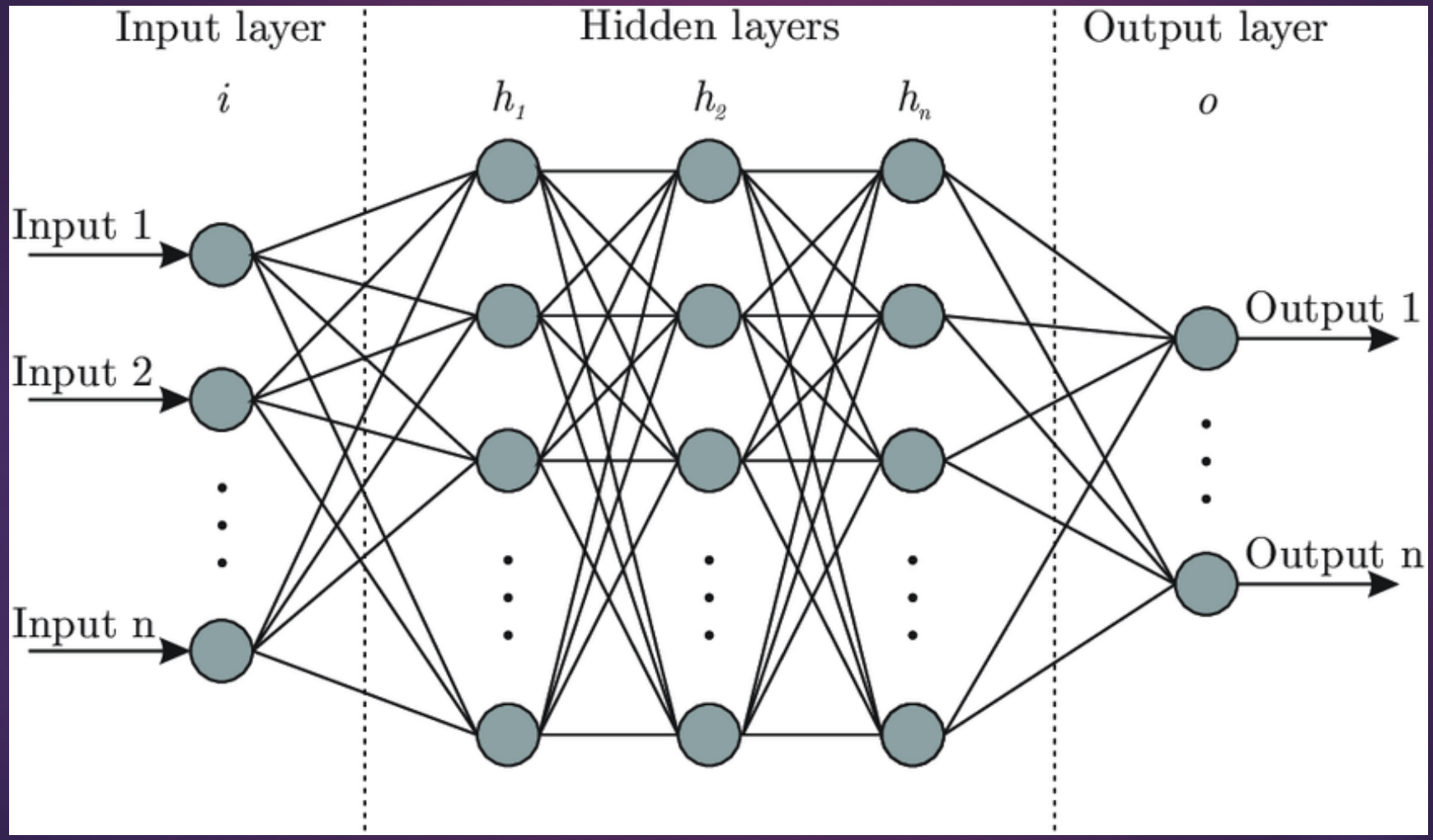
by D. Paranjpye A. Mahabal, A.N. Ramaprakash, G. V. Panopoulou, K. Cleary, A.C.S. Readhead, D. Blinov, K. Tassis (2019)

Neural Networks-Deep Learning

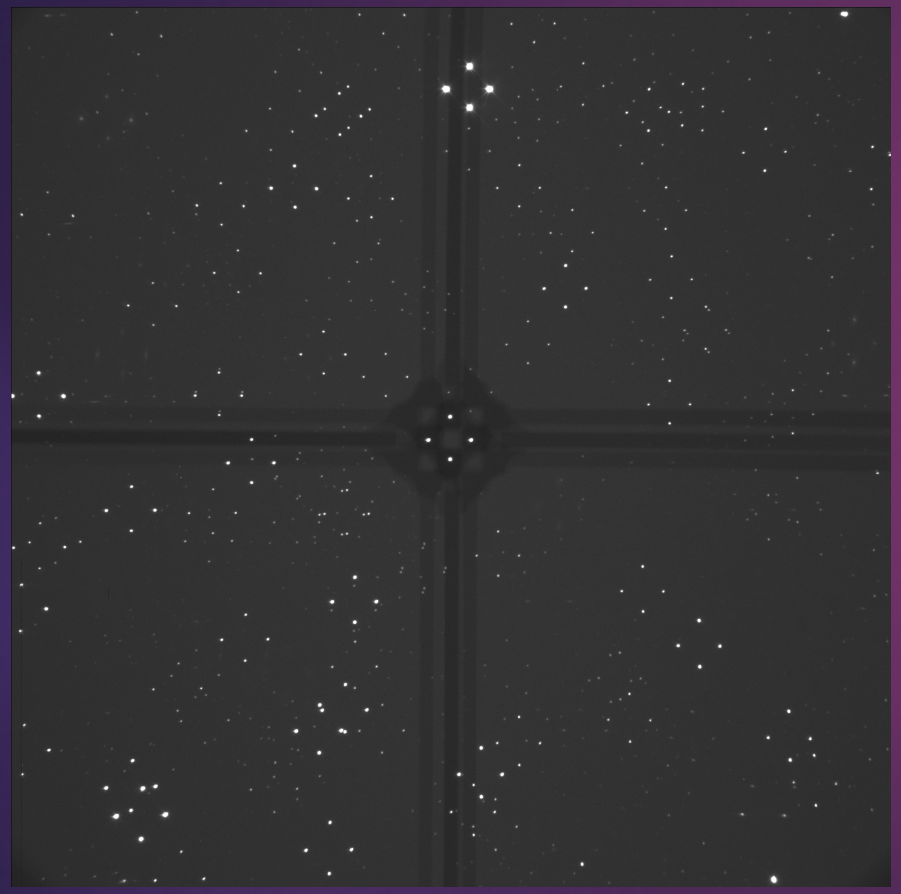
1 Node



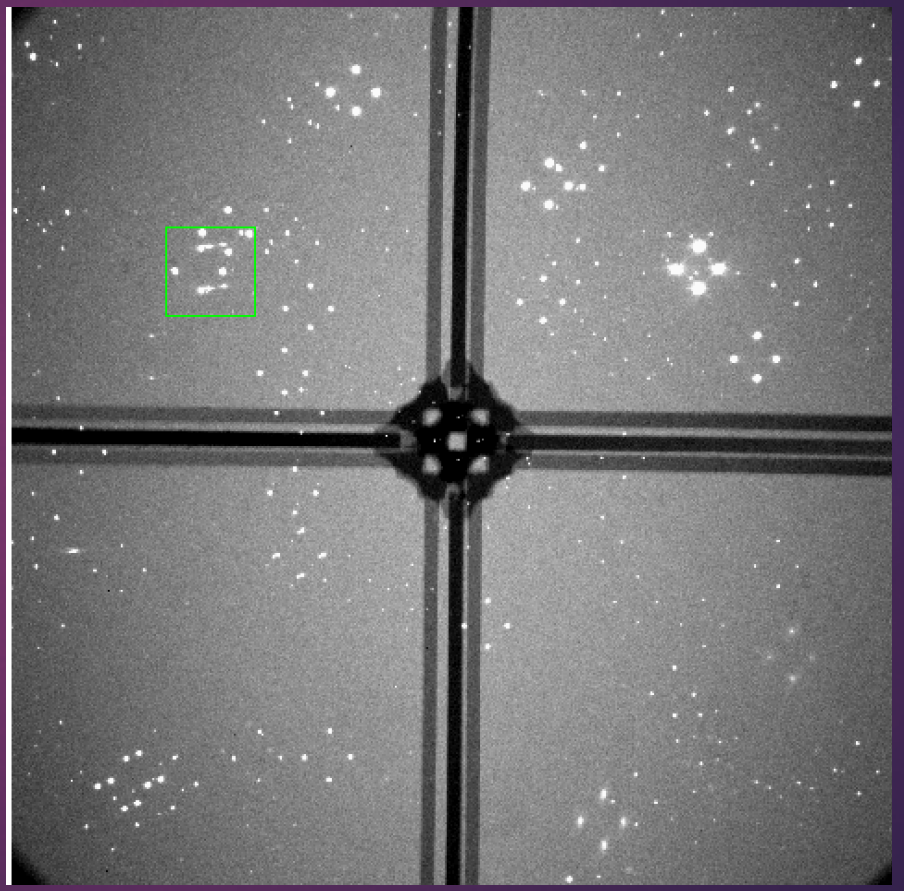
Neural Networks-Deep Learning



Robopol Image



Data used by code



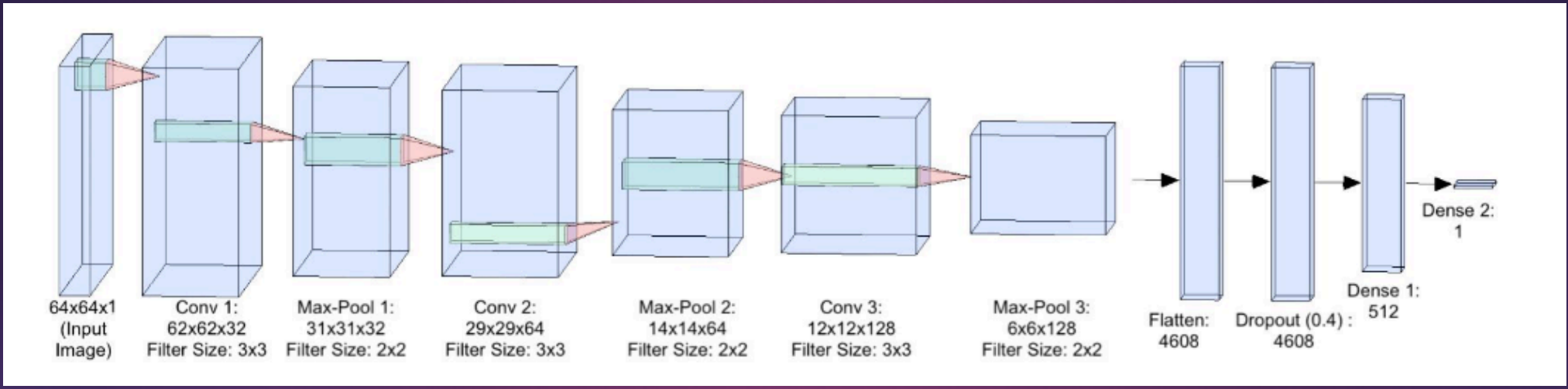
Examples of cutouts

64
px

64
px

Augmented
image

CNN



- 1408 training images
- 100 epochs with 352 steps each
- Learning rate of 0.001

$$Precision = \frac{TP}{TP + FP}$$

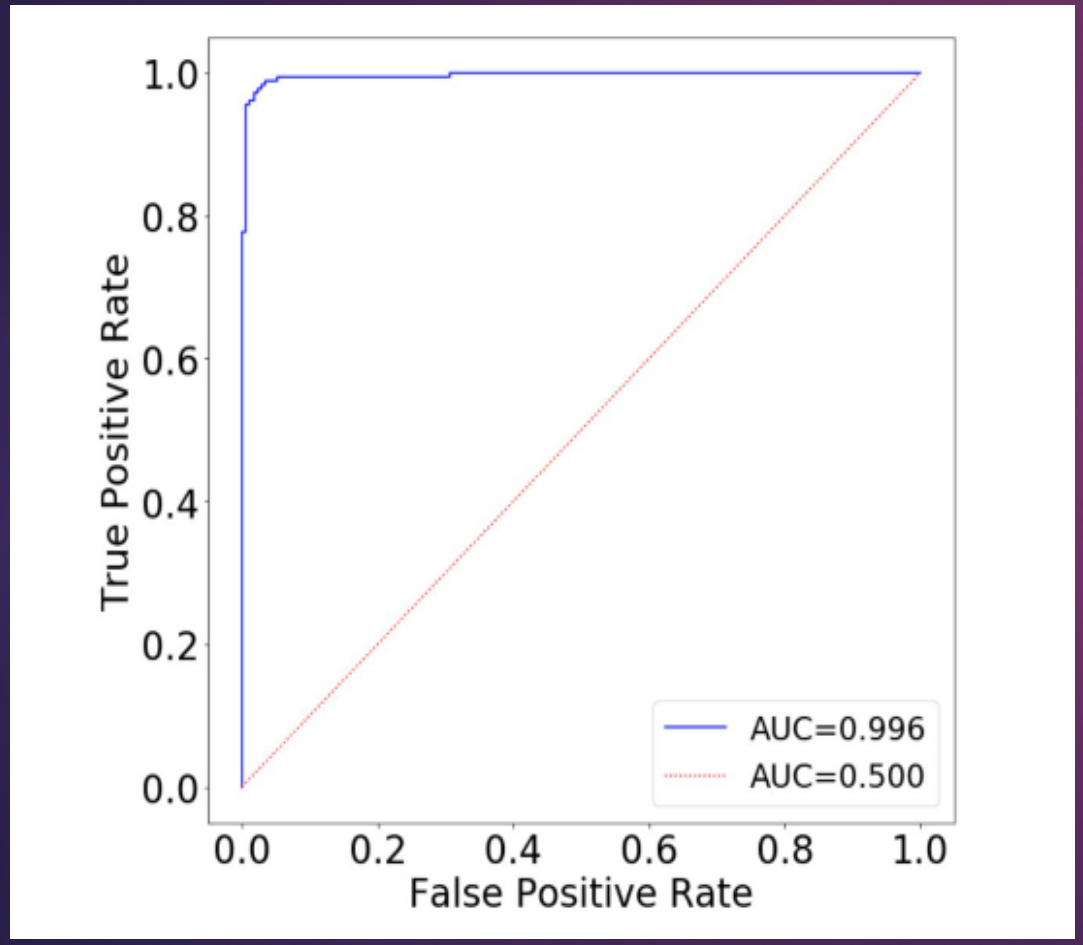
$$Recall = \frac{TP}{TP + FN}$$

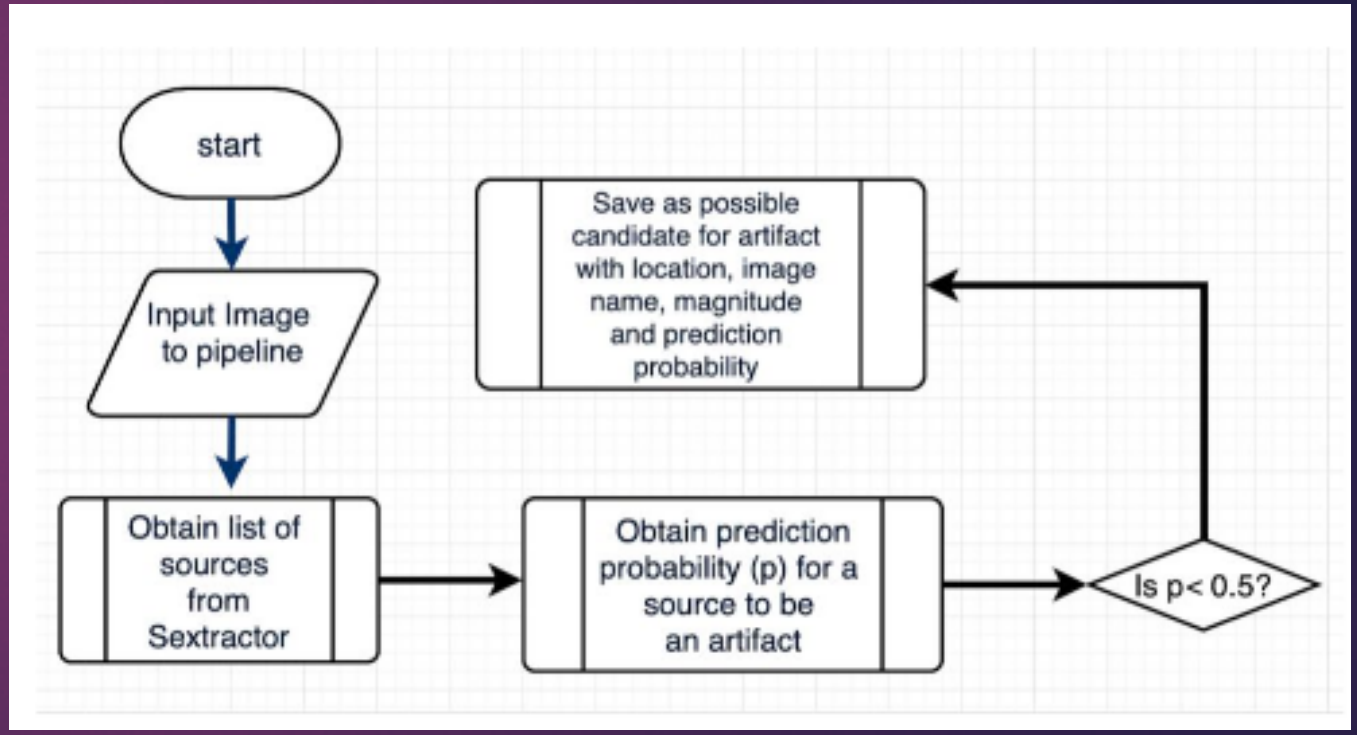
$$F1\ score = \frac{2 \cdot precision \cdot recall}{precision + recall}$$

$$MCC = \frac{TP * TN - FP * FN}{\sqrt{(TP + FP)(TP + FN)(TN + FP)(TN + FN)}}$$

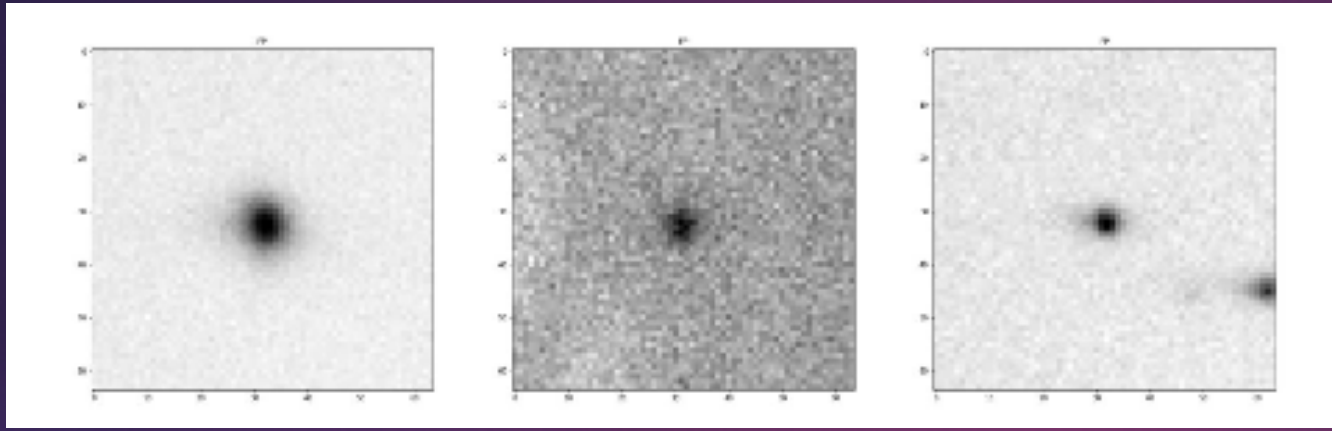
CNN

Receiver Operating Characteristics (ROC) curve

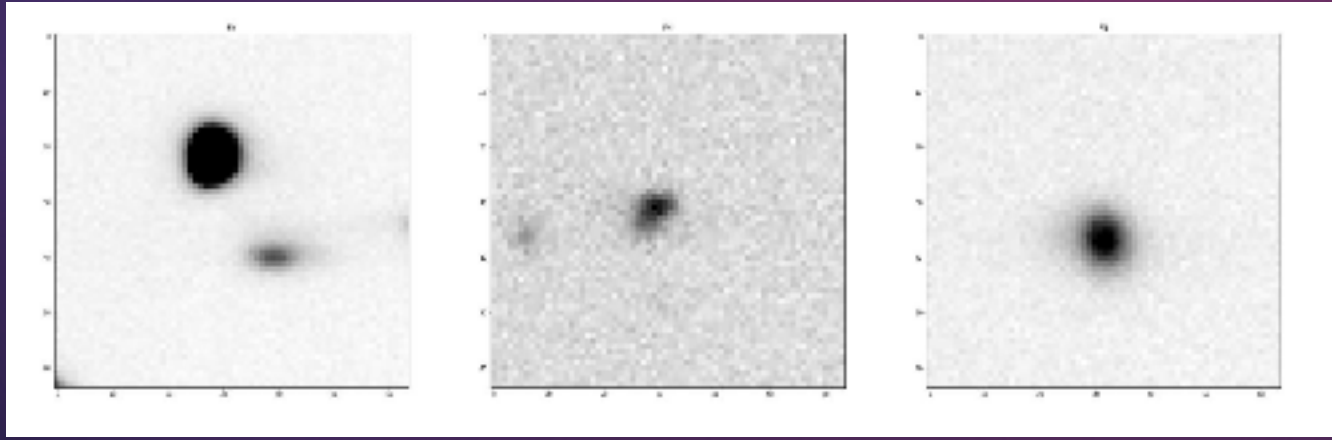




Testing



stars classified as artefacts



artefacts classified as stars