



CHINESE PORCELAIN MARK CLASSIFIER

By **Cheong Hao Ming**
Capstone Project for DSI30

TABLE OF CONTENTS

- 01 INTRODUCTION
Background & Problem Statement
- 02 DATA
Data Collection & Organisation
Image Augmentation
- 03 MODELLING
Process
Evaluation
- 04 CONCLUSION
Conclusion
Future Works

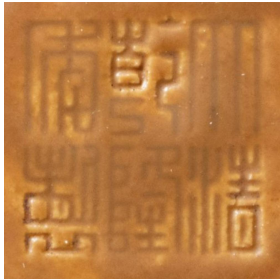


01

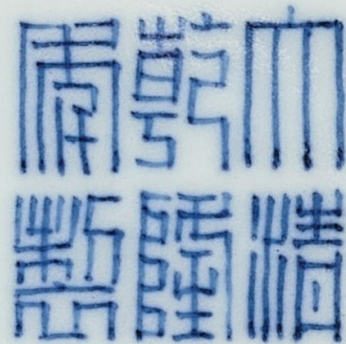
INTRODUCTION

WHAT IS A PORCELAIN MARK?

- Usually found at the base
- Written, Stamped, Incised
- Maker's Mark, **Reign Mark**, Pattern Mark



WHY BUILD A MARK CLASSIFIER?



WHY BUILD A MARK CLASSIFIER?



- Help Budding Collectors



- Provides Important Information



- Appraisal & Value



02

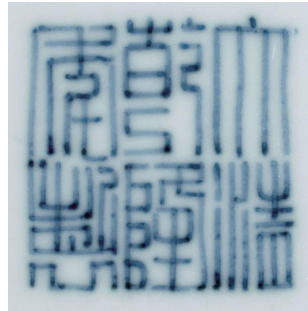
THE DATA

DATA COLLECTION

Sotheby's



CHRISTIE'S



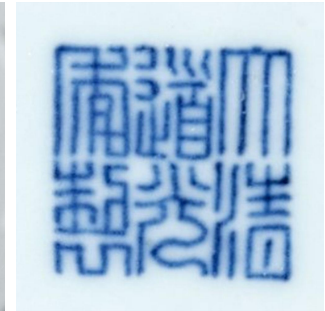
Qianlong
Zhuanshu
Six Character
Mark

X102



Guangxu
Kaishu
Six Character
Mark

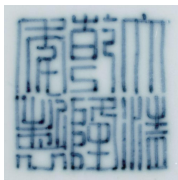
X100



Daoguang
Zhuanshu
Six Character
Mark

X100

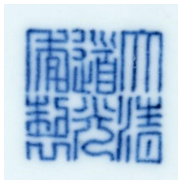
DATA ORGANISATION



X62

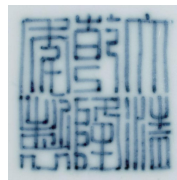


X60

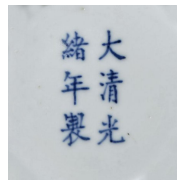


X60

TRAIN



X20

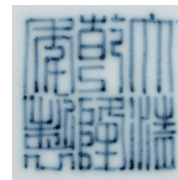


X20



X20

VALIDATION



X20 + 10



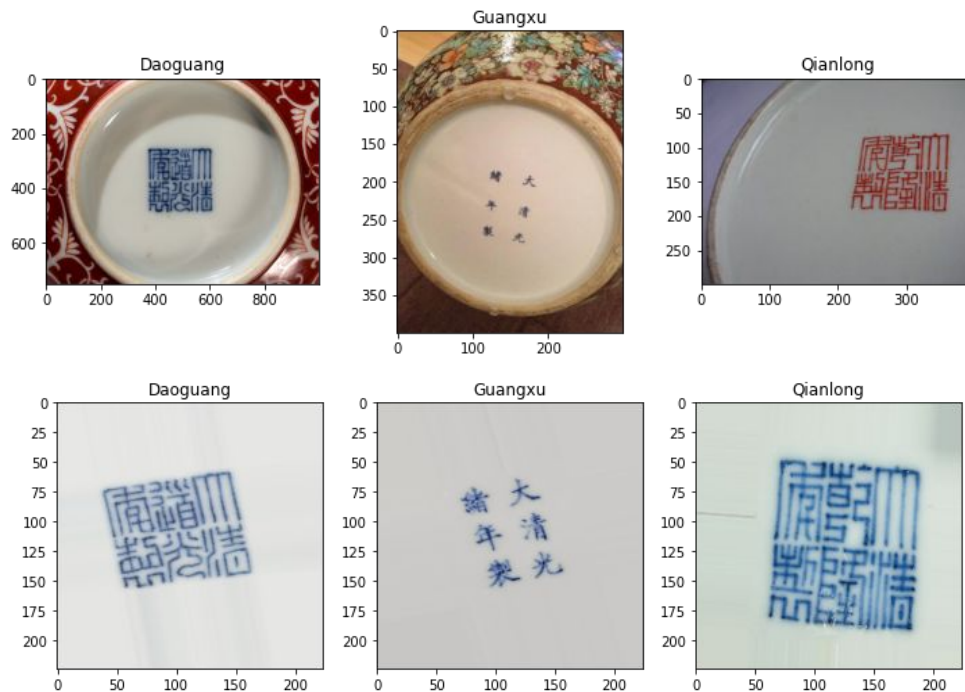
X20 + 10



X20 + 10

TEST

NOISY TEST IMAGES VS AUGMENTED IMAGES





03

MODELLING



MODELS BUILT



MODELLING PROCESS

Build the Layers



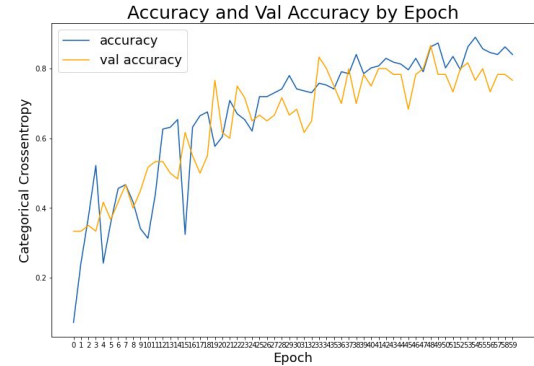
Compiling the Layers

Loss Function:
Categorical Crossentropy

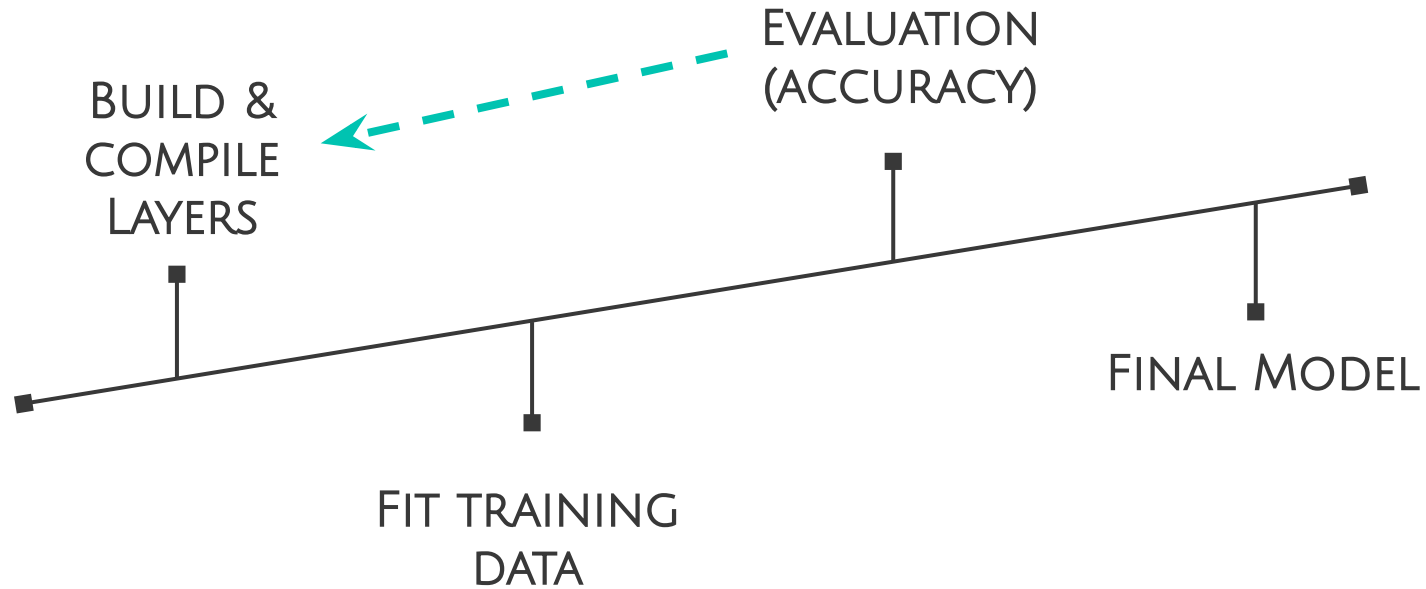
Optimizer:
Adam

Metrics:
Accuracy

Training the Model



MODELLING PROCESS



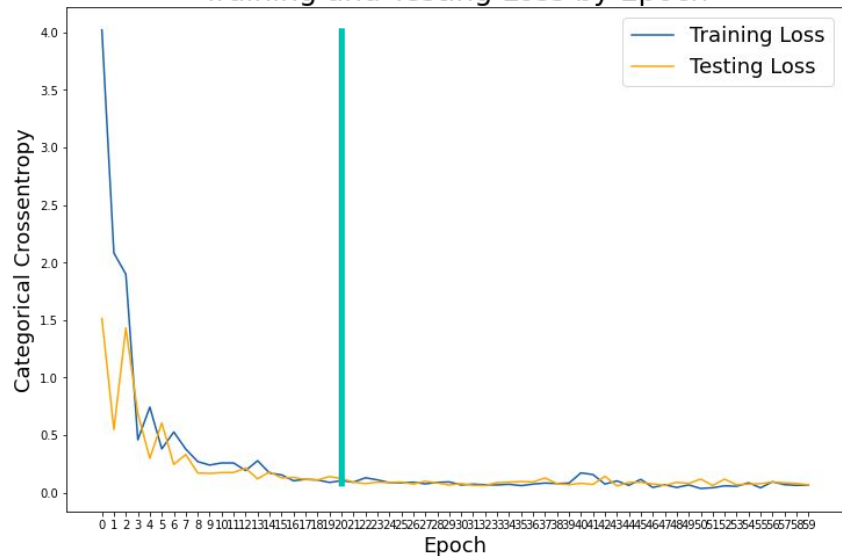


EVALUATION

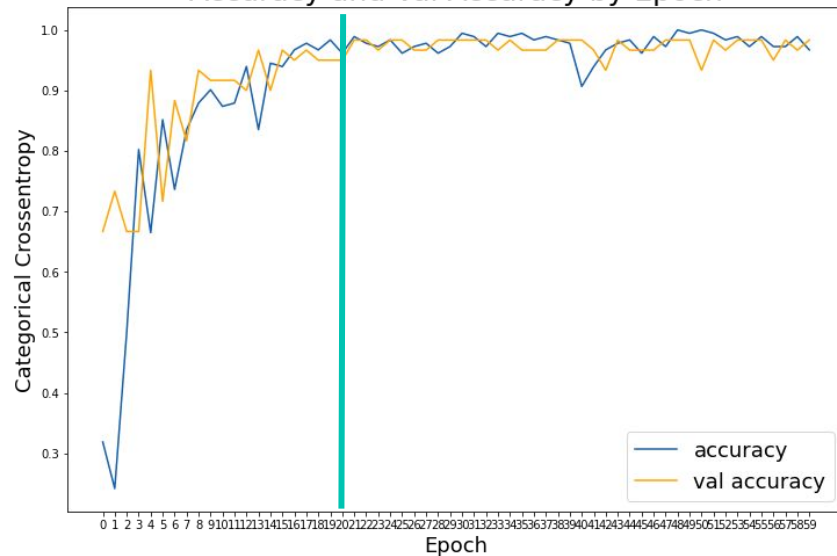
	Model	Train Acc	Train Loss	Test Acc	Test Loss
1	Custom CNN	0.8571	0.4086	0.5889	1.1550
2	VGG19 Base	0.9780	0.0891	0.8444	0.4432
3	VGG19 Custom	0.9066	0.3201	0.7333	0.5852
4	MobileNet Base	0.9945	0.0251	0.7889	12.2197
5	MobileNet Custom	0.9890	0.1059	0.8000	0.5620

EVALUATION

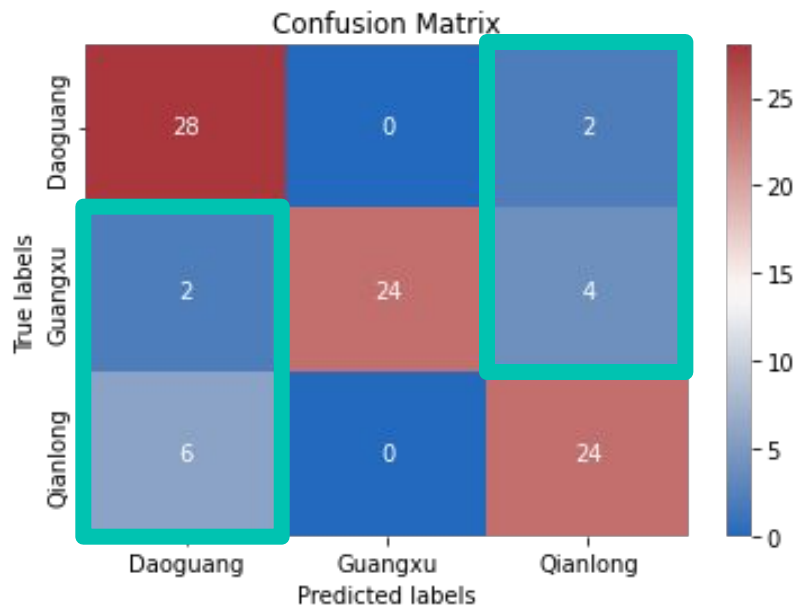
Training and Testing Loss by Epoch



Accuracy and Val Accuracy by Epoch



PREDICTION RESULTS



Accuracy = **84%**

MISCLASSIFIED IMAGES

Predict: Qianlong, Actual: Daoguang



Predict: Qianlong, Actual: Daoguang



Predict: Daoguang, Actual: Guangxu



Predict: Daoguang, Actual: Guangxu



Predict: Qianlong, Actual: Guangxu



Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



Predict: Qianlong, Actual: Guangxu



Predict: Qianlong, Actual: Guangxu



Predict: Qianlong, Actual: Guangxu



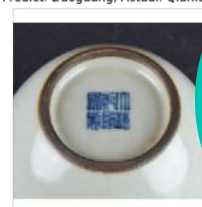
Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong

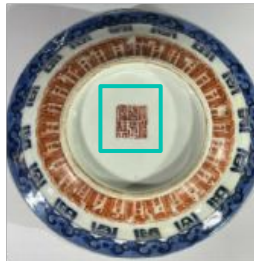


CLEAN TEST SET

Predict: Qianlong, Actual: Daoguang



Predict: Qianlong, Actual: Daoguang



Predict: Daoguang, Actual: Guangxu



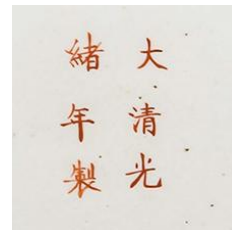
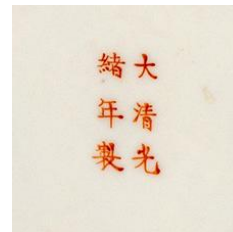
Predict: Qianlong, Actual: Guangxu



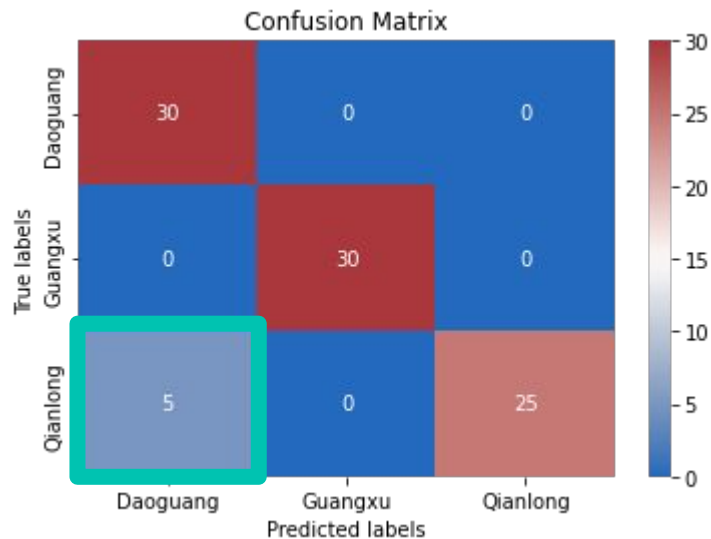
Predict: Qianlong, Actual: Guangxu



Predict: Qianlong, Actual: Guangxu



CLEAN TEST SET



Accuracy = **94%**

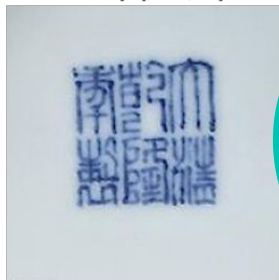
12% Improvement

MISCLASSIFIED IMAGES

Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



Predict: Daoguang, Actual: Qianlong



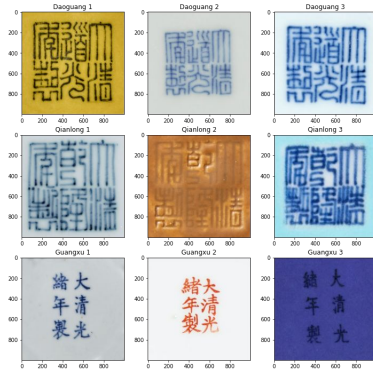
- Only between “Daoguang” and “Qianlong”
- Majority from noisy data



04

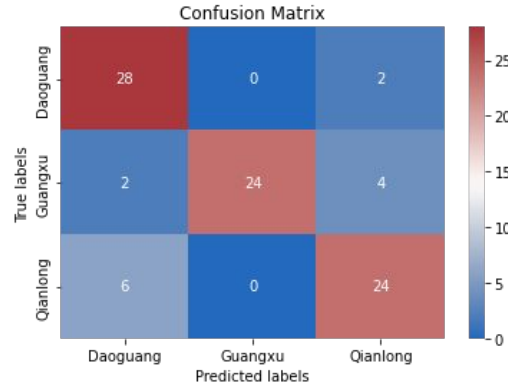
CONCLUSION

CONCLUSION



SMALL DATASET

Self-collected 332 images in total



ACCURATE

84% accuracy

Misclassified Images by VGG19 Base Model



LIMITATIONS

Struggle with noisy images

FUTURE WORKS



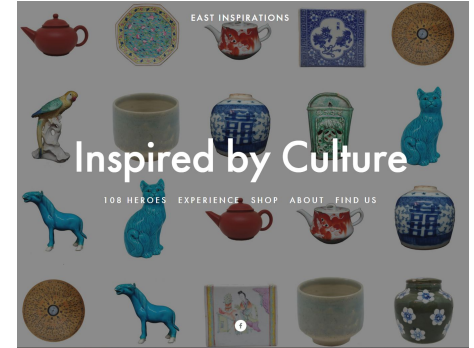
OBJECT DETECTION

Improve accuracy by
removing the noise



ADD CLASSES

Complete collection of
Qing Dynasty Reign
Marks



WEB DEPLOYMENT

Engage customer and
collect more data

THANKS

Do you have any questions?



CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by **Freepik**

Please keep this slide for attribution