Naqsh: Recognition and Translation of the Ancient South Arabian Musnad font's Inscription letters

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Abstract

Inscriptions are an important source of historical information and are often found on hard surfaces such as stones and monuments. The Musnad font is considered one of the earliest forms of writing in the Kingdom of Saudi Arabia, preceding the modern Arabic font. This project aimed to recognize the Musnad font, a dataset of Musnad inscriptions was collected from the Ministry of Culture and preprocessed for recognition using three different Convolutional Neural Network (CNN) architectures. The VGG16 model achieved the highest accuracy of 93.81%, followed closely by MobileNetV2 at 93.52%, with ResNet50 achieving 89.39%.
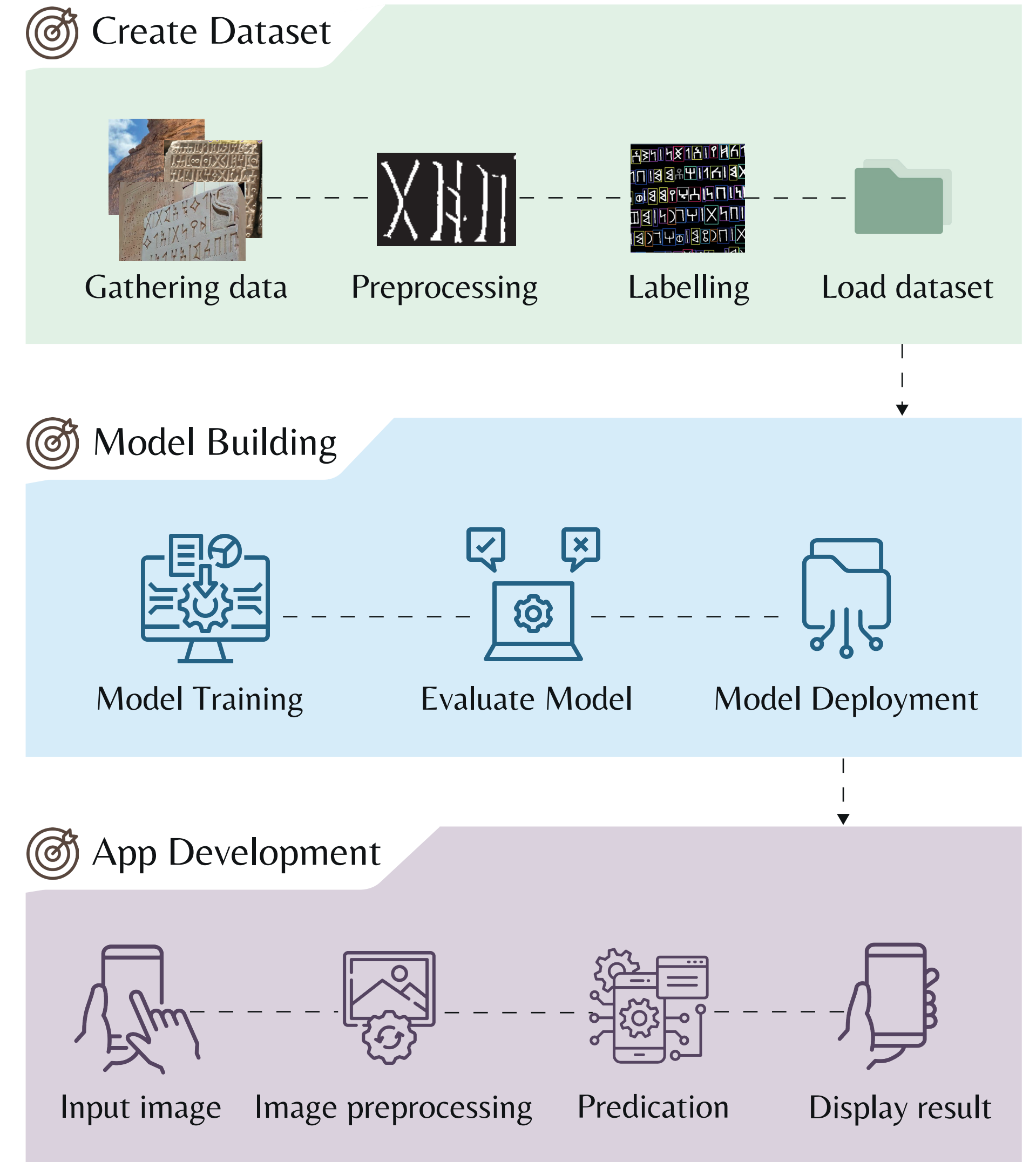
Objectives

- Create a dataset specifically for the Musnad font.
- Compare the effectiveness of three different Convolutional Neural Network models (VGG16, MobileNetv2, and ResNet50).
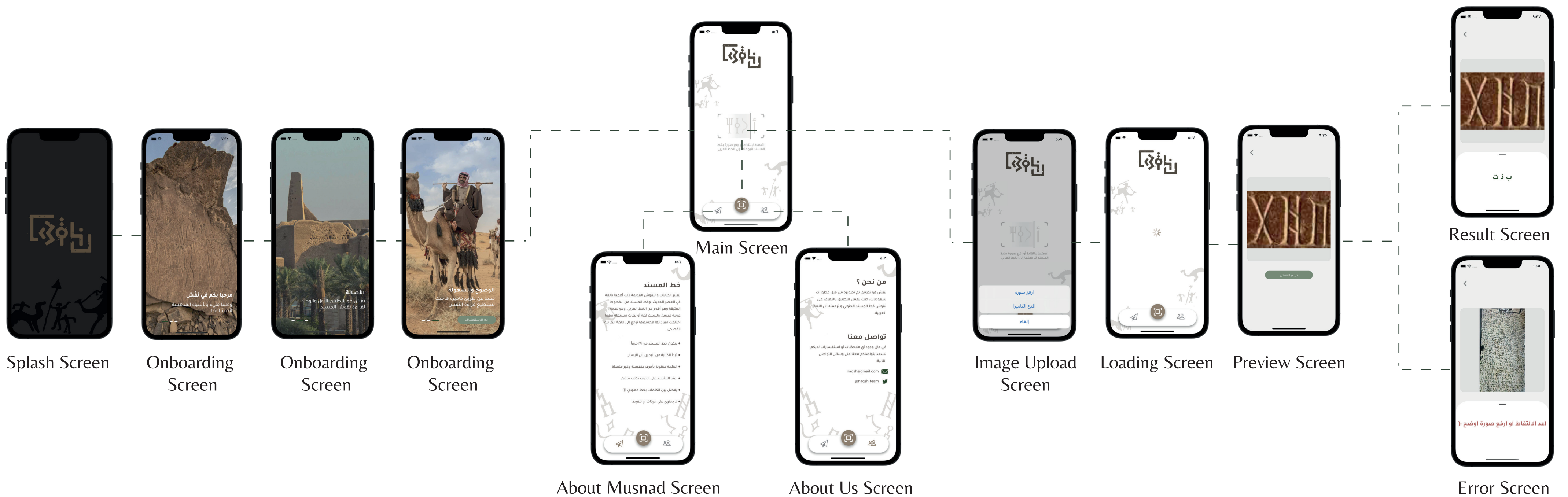- Develop a system for recognition and translation of the Musnad font.

Development tools

roboflow | python | Spyder | React | Flask
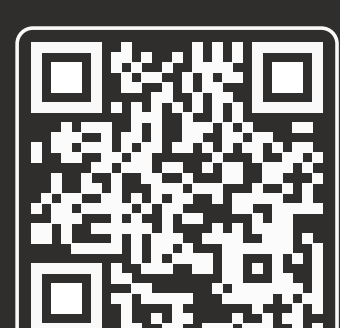
Dataset Preparing | Model Train | App Development

Methodology

Create Dataset

Gathering data → Preprocessing → Labelling → Load dataset

Model Building

Model Training → Evaluate Model → Model Deployment

App Development

Input image → Image preprocessing → Predication → Display result

Interfaces

Splash Screen | Onboarding Screen | Onboarding Screen | Onboarding Screen

Main Screen

About Musnad Screen | About Us Screen

Image Upload Screen | Loading Screen | Preview Screen

Result Screen

Error Screen

Result

	Precision	Recall	F1-score	Test-accuracy	Test-loss
VGG16	93.00	91.00	91.00	93.81	23.79
ResNet50	90.00	83.00	85.00	89.39	40.05
MobileNetV2	92.00	91.00	91.00	93.52	31.84

Conclusion

- Successfully developed application for automating recognition and translation of Musnad font, make reading inscriptions easier and more accessible.
- Improvement can be made by enlarging data sets and enhancing image processing for generating high-quality data set.
- Natural language processing can be used to determine Arabic meaning of words in Musnad font to further enhance results.

Scan to view a small poster presentaion

Scan to view the references

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