CLASSIFICATION OF MICROSTRUCTURES IN VARIOUS IRON ALLOYS

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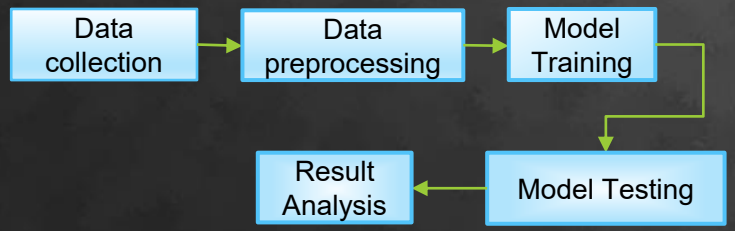
Abstract

This study utilizes a microstructure image classification model to accurately identify various iron-based alloys, including stainless steel, from microscopic images.
The model demonstrates high confidence and reliable results in distinguishing stainless steel microstructures among other cast irons.

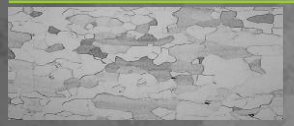
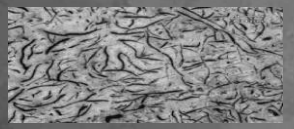
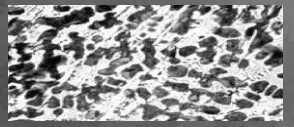
Introduction

This research uses Landing AI to create an automatic classification system for identifying various forms of iron microstructures in microscopic photographs. The model identifies between various iron alloys, such as grey cast iron, ductile iron, white cast iron, and stainless steel, using advanced machine learning techniques.

Methodology



Input/output

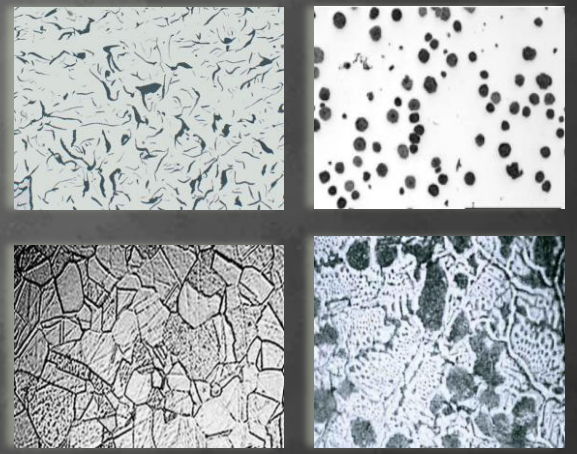
Input	Actual	Predicted	Result
	Stainless Steel	Stainless Steel	✓
	White Cast Iron	White Cast Iron	✓
	Grey Cast Iron	Grey Cast Iron	✓
	White Cast Iron	Ductile Iron	✗

Conclusion

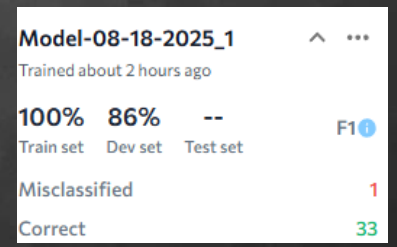
The model demonstrated consistently high accuracy in classifying microstructures such as grey cast iron, ductile iron, white cast iron, and stainless steel. Across train and dev sets, predictions closely matched ground truth with strong confidence scores, indicating robust performance and reliability in defect identification.

Steps to use the application

- Click a picture of a sample from below
- Scan the QR code
- Upload the picture



Result



References

https://landing.ai