

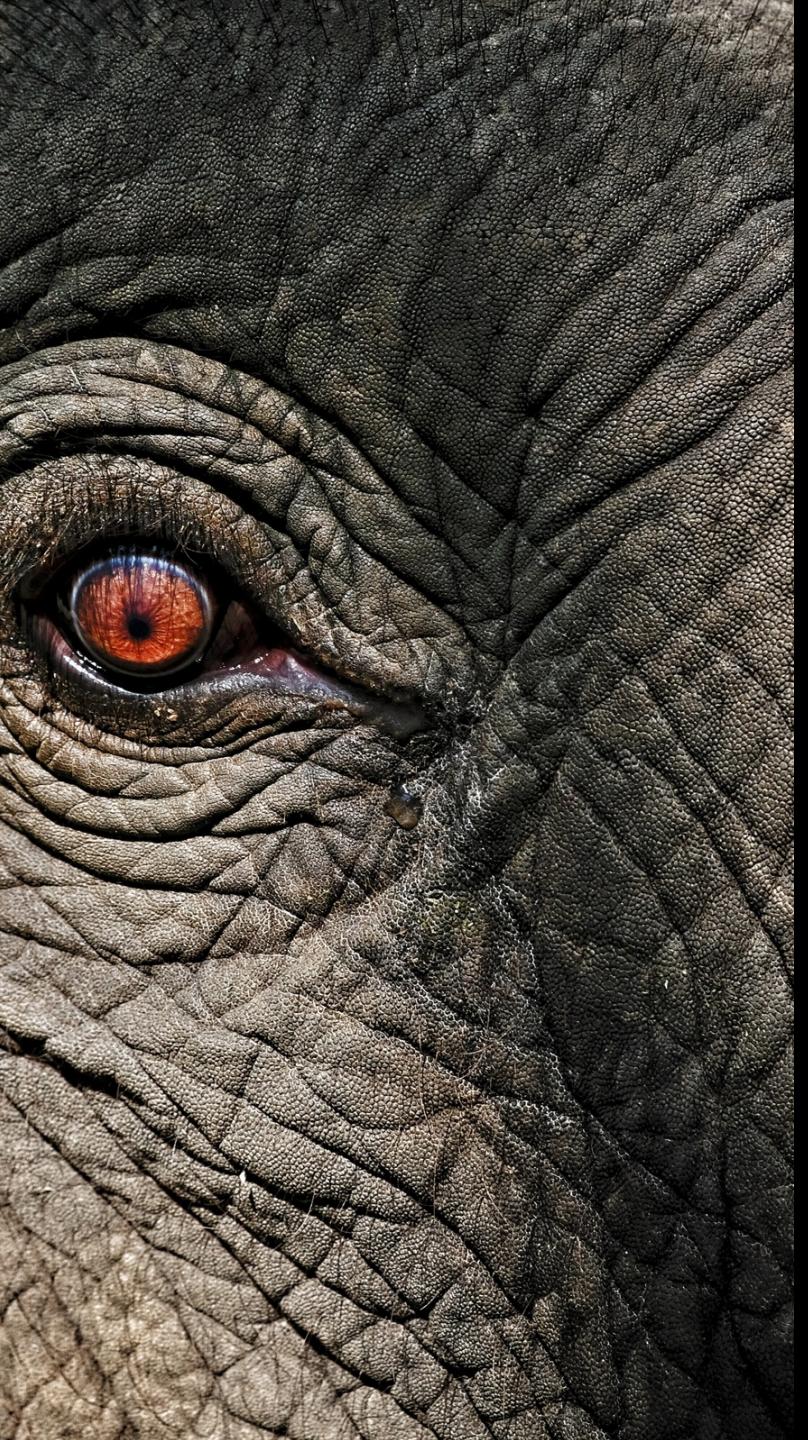


# *Identifying Ivory: The Met Museum Ivory Classification Model*

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Using neural network-based image recognition to prevent the illegal online sale of elephant ivory

By Ryan Posternak & Harrison Carter



# Agenda

- 1 | Overview & Context
- 2 | Data Understanding
- 3 | The Model
- 4 | Results & Evaluation
- 5 | Conclusion & Recommendations

# Overview and Context

“Elephants are only extant at our discretion” - Unknown

## Keystone Species

From habitat creation to seed dispersal, forest pathway creation, and brush cover management, elephants are critical components of their ecosystems

## Dwindling Numbers

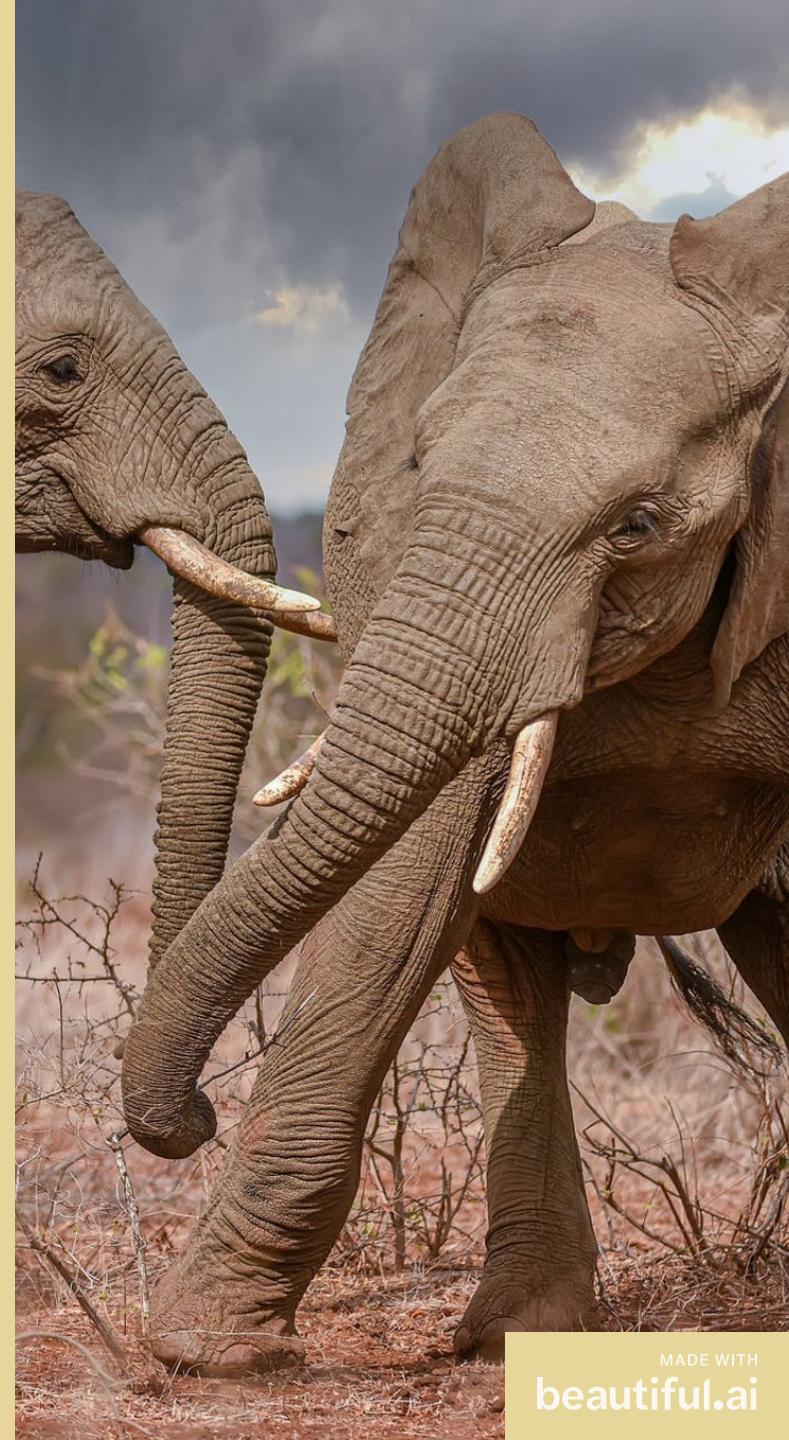
Each year poachers kill an estimated 20,000 wild elephants, primarily for their tusks. Only 450,000 elephants remain in the wild

## Ivory Trade

56 tons of ivory entered Vietnam between 2009-2018 alone. The rise of online marketplaces has only served to exacerbate the problem

## Call to Action

Curbing ivory markets and eliminating the incentive to poach is our top priority. A 2021 study by DICE found that the online ivory trade is thriving in online marketplaces



# Data Understanding

All data for this project was obtained from The Met's open-source API



Non-ivory



Non-ivory



Ivory



Non-ivory



Ivory



Ivory



## A Convolutional Neural Network (CNN)

# The Model

Train accuracy: 86.8%

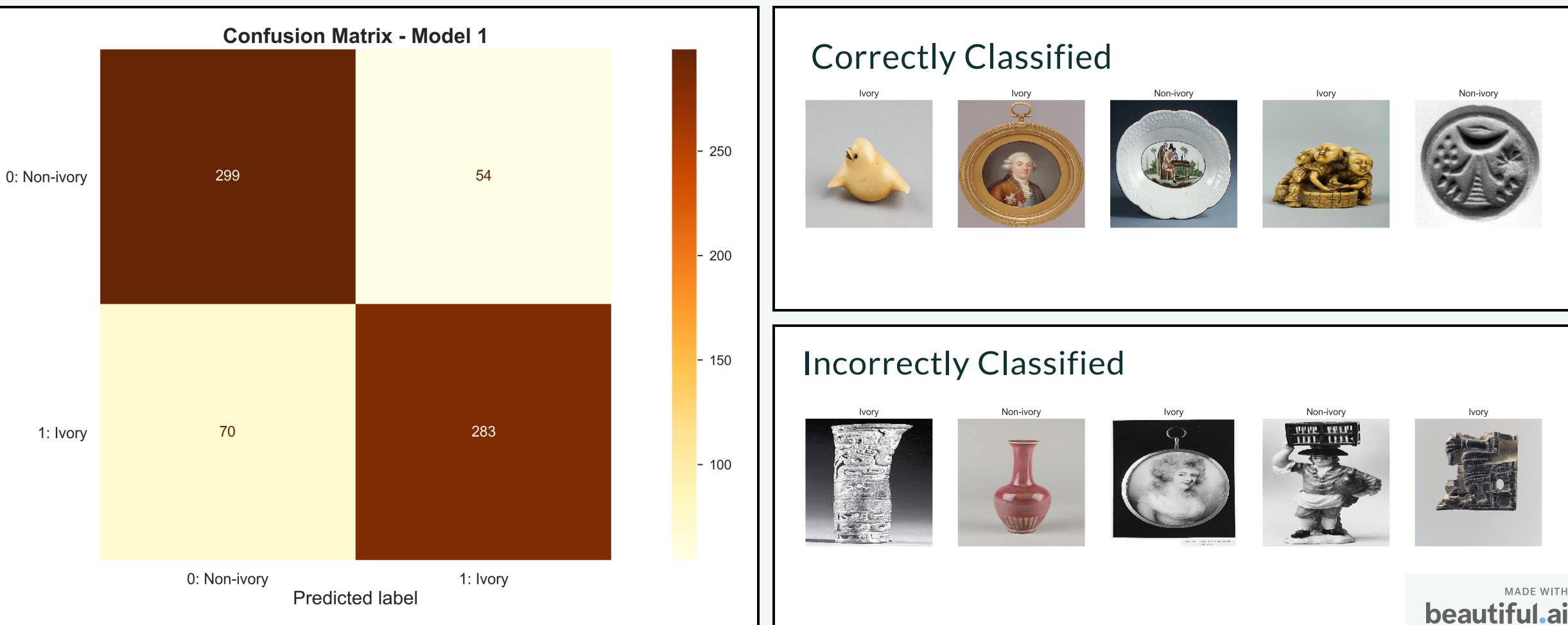
Test accuracy: 82.4%



# Results and Evaluation

Precision: 85%

Recall: 80%



# Conclusions and Recommendations

**1** Successful classification of ivory is possible

**2** Be aware of limitations: (1) not fully representative dataset, (2) also detects non-elephant ivory

**3** Consider which forms of ivory are used to train the model, and the trade-off between precision and recall

**4** Next steps: (1) obtain more and more recent data, (2) experiment with other NNs, tuning, preprocessing



# Thank You



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