

PostScriptML

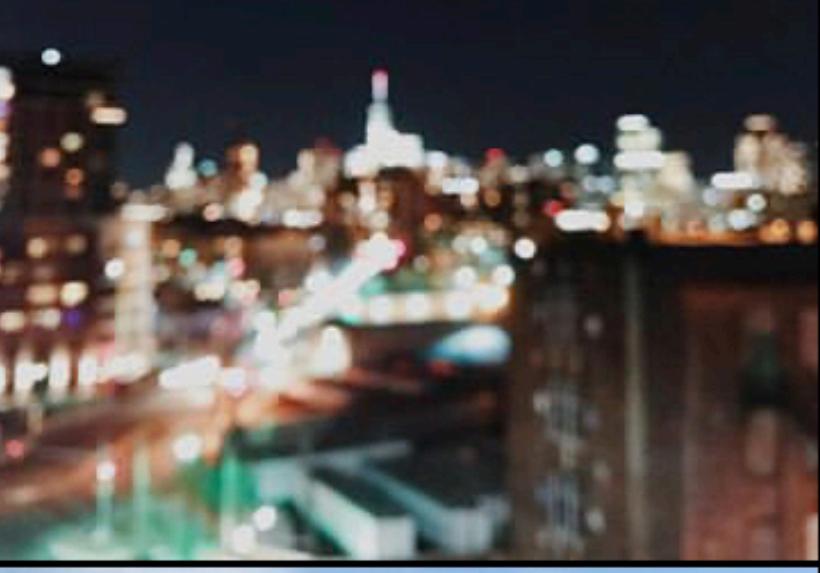
Using CNNs for image classification
in the post processing of photographs

Dolci Key Sanders September 2020

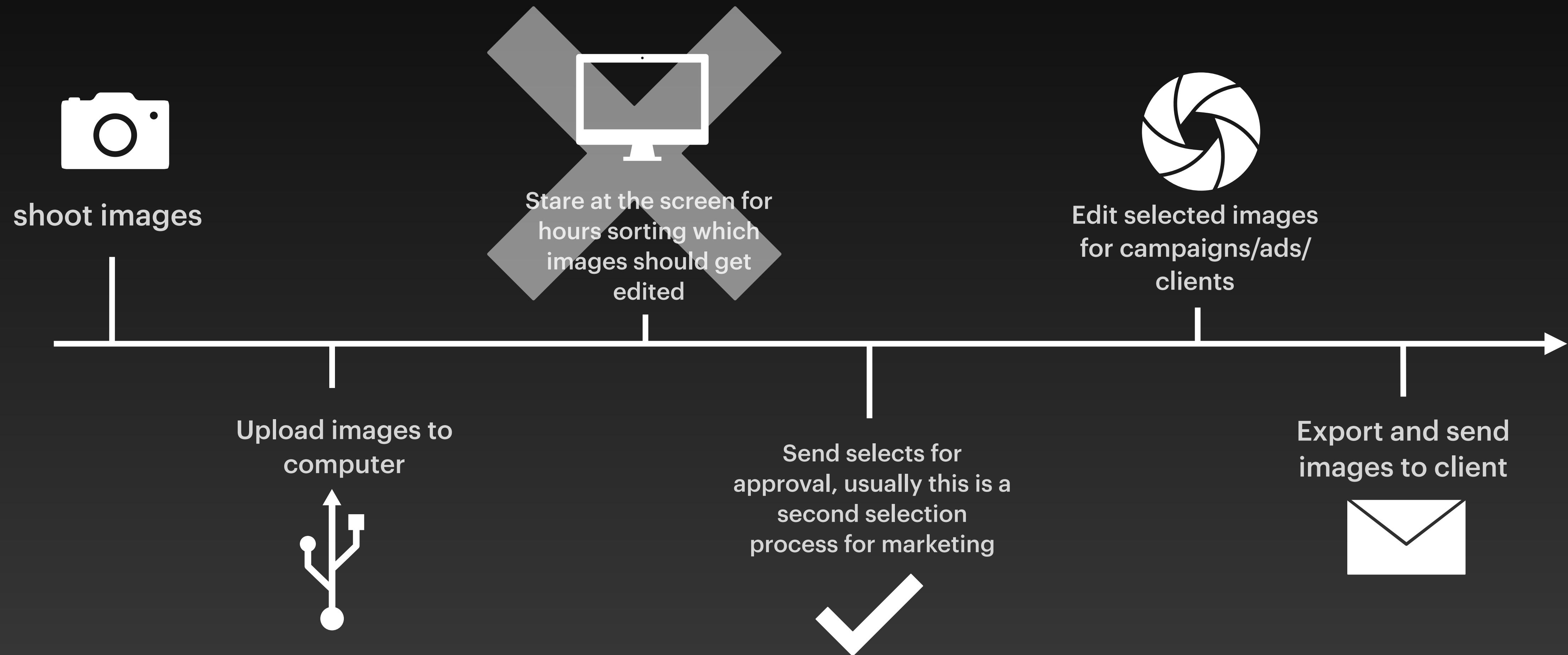
Content is today's marketing currency.

Photography

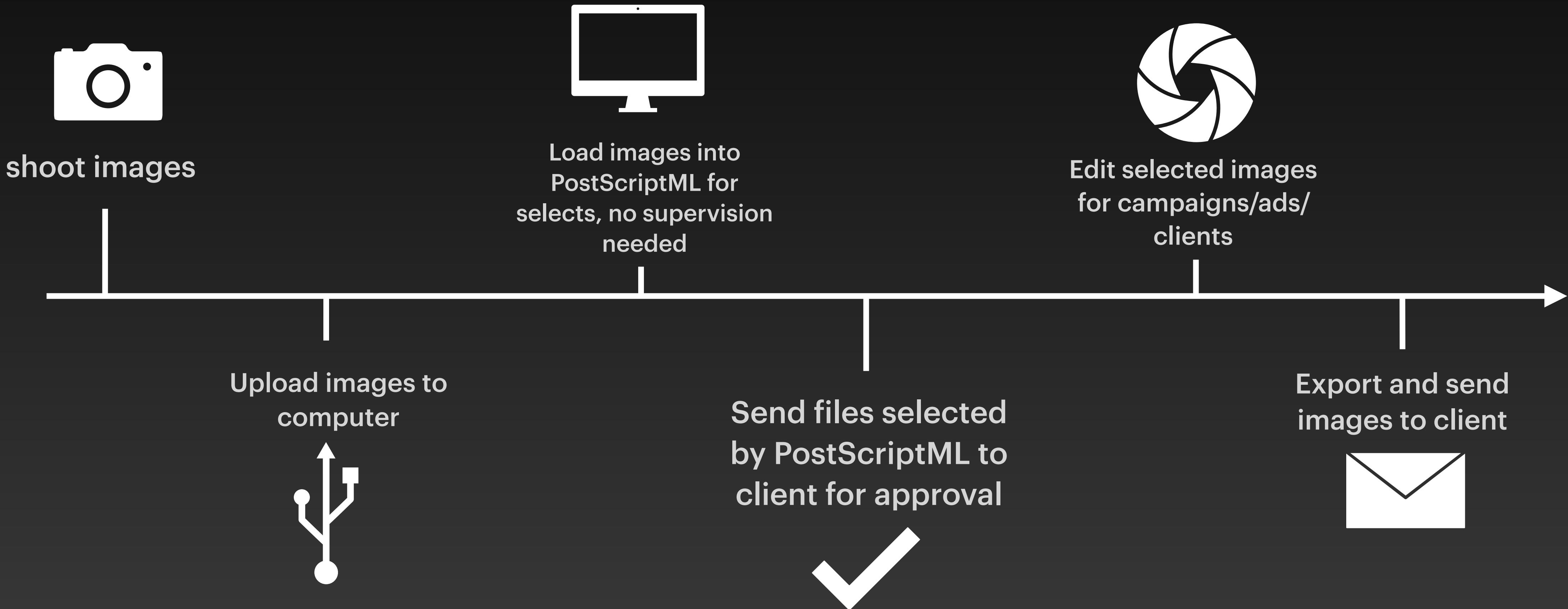
- Today's marketing relies heavily on a flow of image content.
- Once images are taken, they are sorted into selection folders before they are edited. This is how photographers know what to edit and what to reject/throw away.
- Sorting through 1000 photos for the best images can hours.



Photographers' Work Flow



With PostScriptML



Sorting through Unedited Images

images by @dolcikeyphotography



Reject
Model is blinking

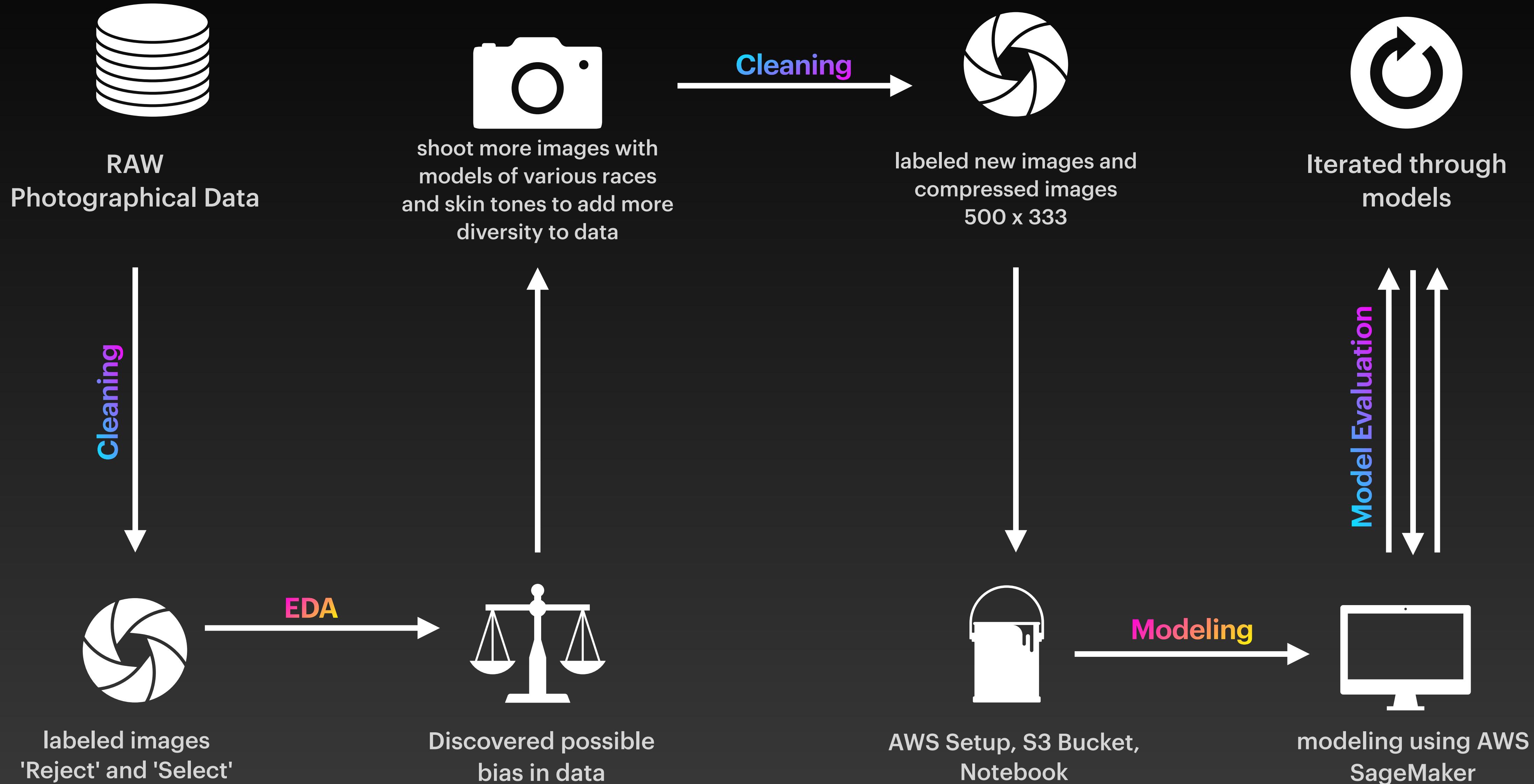


Select
In focus, elongated neck, interesting lines



Reject
Neck is too short here

CRISP-DM Data Journey



Data

3282

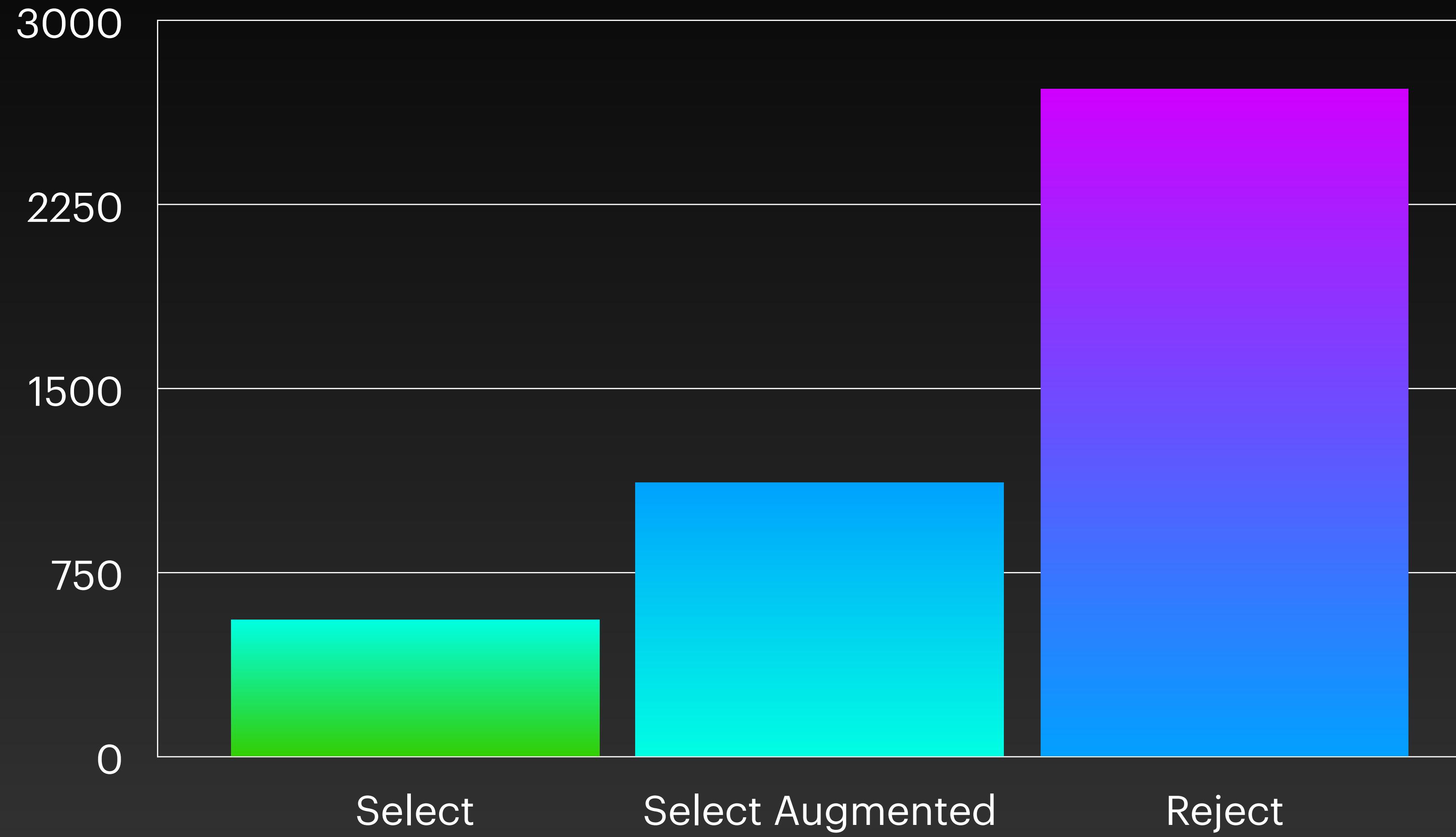
total images

Data Considerations

- Dealing with Class Imbalance
- Minimizing Racial Bias
- Acknowledging Selection Bias



Classification of Data



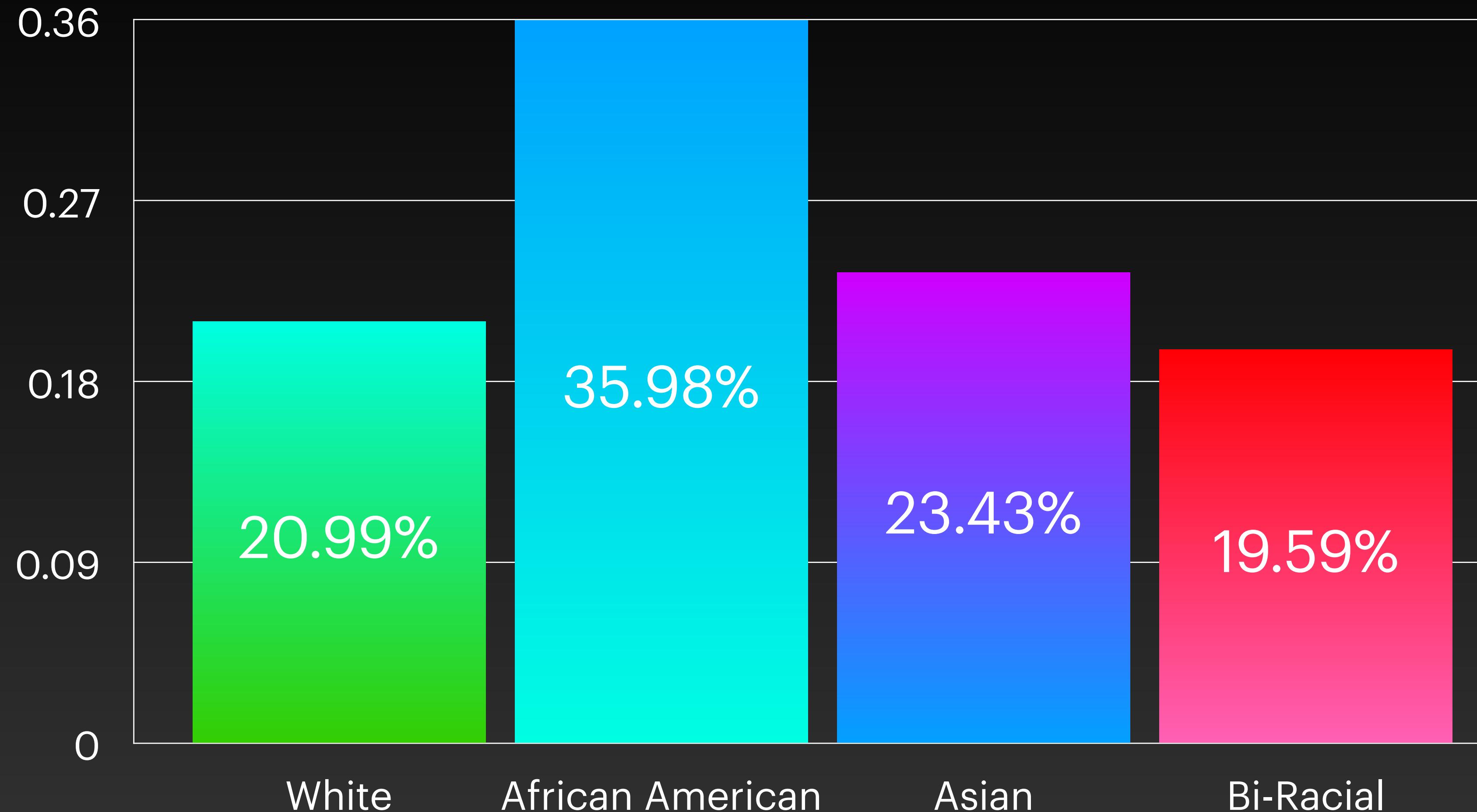
Select being the positive class (good images), Reject being the negative class (bad images)

Minority Class Considerations

- horizontal augmentation of selects
- Binary Accuracy
- Loss Metric



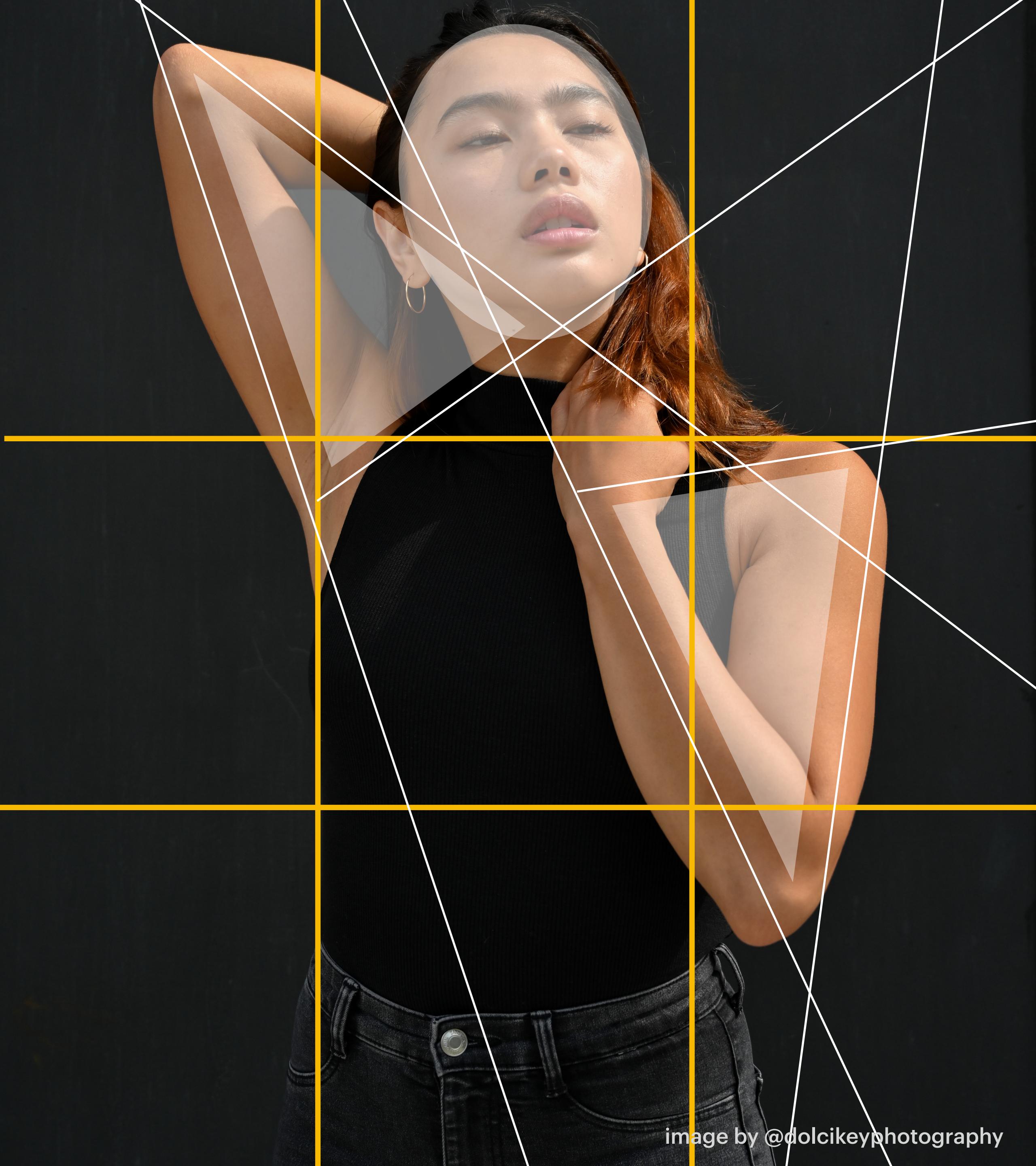
Exploring the Racial Breakdown of Overall Data



CNNs can become racially bias when there is not enough representation of a races in a training data set. Including images with diverse subjects will help make sure the model is not racist and can determine a good or bad photo regardless of the race of the subject.

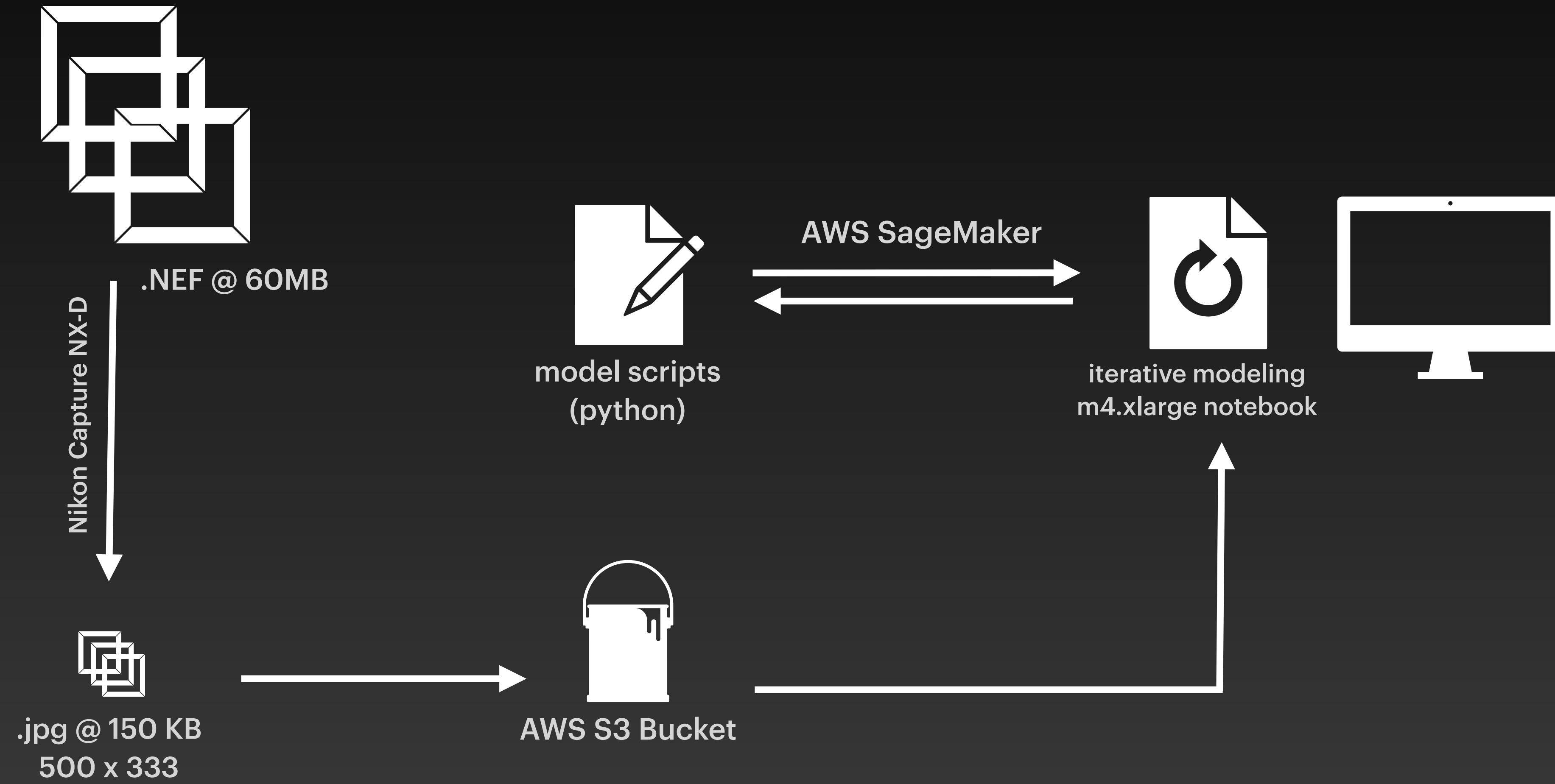
Artistic Bias

When selecting images, I relied on what I've learned over years of being both behind and in front of the camera. Prioritizing focused eyes/faces, balanced light, framing rules (rule of thirds), consideration of geometric shapes.



Modeling using AWS

Modeling Pipeline



Metrics

For my models, I specified a particular parameter in the .compile step.

```
_tuning_objective_metric = ['recall', 'f1_score']
```

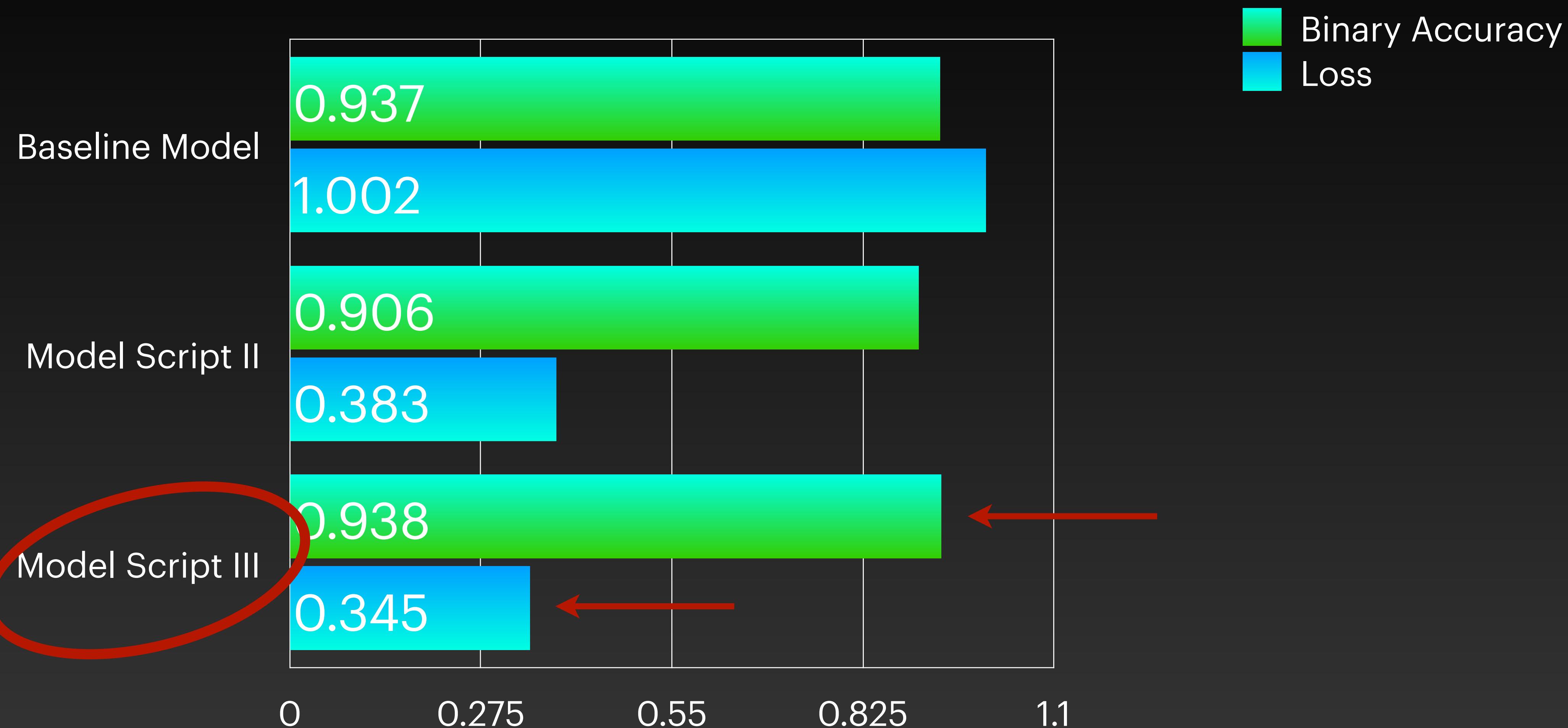
The Keras model in AWS allows you to add additional parameters that the model considers during training (up to 20metrics as per AWS) .

This is another way to help minimize the potential side effects of class imbalance as recall measures false negatives, which we want to minimize.

Metrics

- Loss Function
 - Binary Cross-Entropy
 - Calculates the loss which I hope to minimize.
- Binary Accuracy
 - Default Accuracy metric in Keras for Binary Classification
 - Automaticall defaults when you have 2 classes

Model Performance



Understanding the Best Model

[Model graphic will go here]

Conclusion

Concluding Observations

- This model as a proof of concept shows promise.
- The model can be developed with more accuracy using additional metrics
- As shown by the test data, this model stands to improve on X



Further Steps

- More data (5-10k images)
- Even more diverse models



image by @dolcikeyphotography

Future Business Plans

- Additional models with different types of images like families, weddings, animals, food, products, e-commerce
- Integrated Script for straight NEF compression for photographers
- User friendly application that allows for unsupervised sorting

Sources and Credits

- modeling coding references
 - Paul Breton AWS SageMaker Tutorial on [Medium.com](#)
- Troubleshooting and code debugging help from [Aren Carpenter](#)
- models (A huge thanks to all these talented models who made themselves available for data collection*)
 - Samayah Jaramillo [@samayahjaramillo](#)
 - Kristen Heavey [@kristenheavey](#)
 - Beth Chasteen [@officialchasteen](#)
 - Joana Pauline [@thejoannapauline](#)
- Photography by [Dolci Key Photography](#) (that's me)

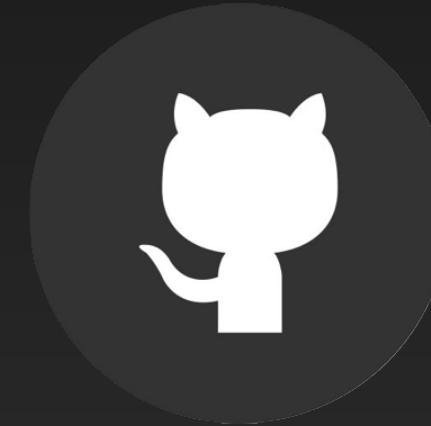
*I traded edited portfolio images to be delivered to each model after my final presentation for usage of this image data in my data set/presentation. This data set will remain private.

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medium



github



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