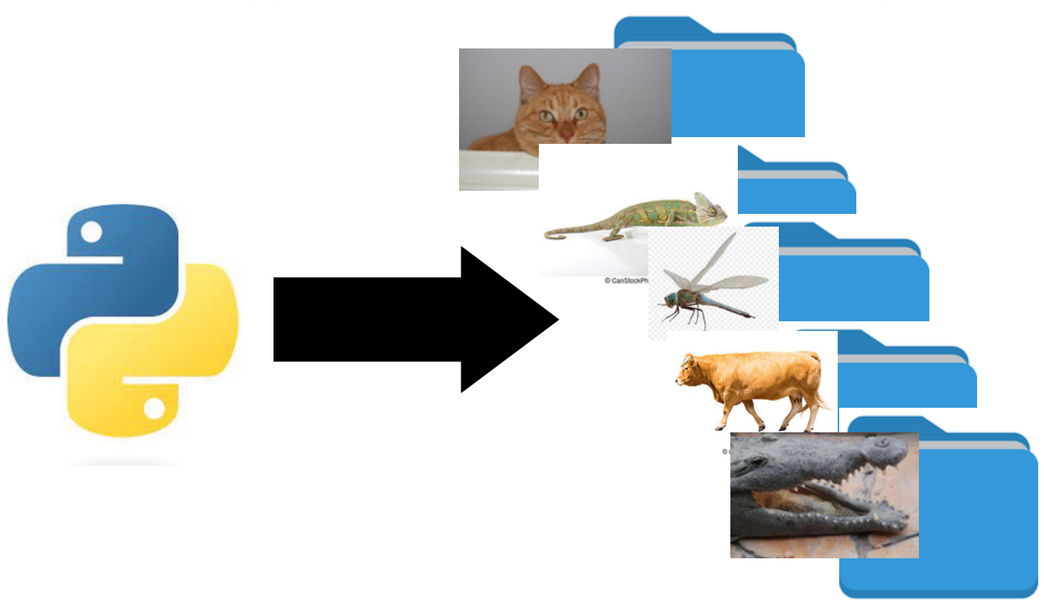
Species Classification

How can we use technology to automatically classify animal images into their respective species?

Nikhita Kalluri, Tingting Liang, Melissa Tam, Brianna Grissom

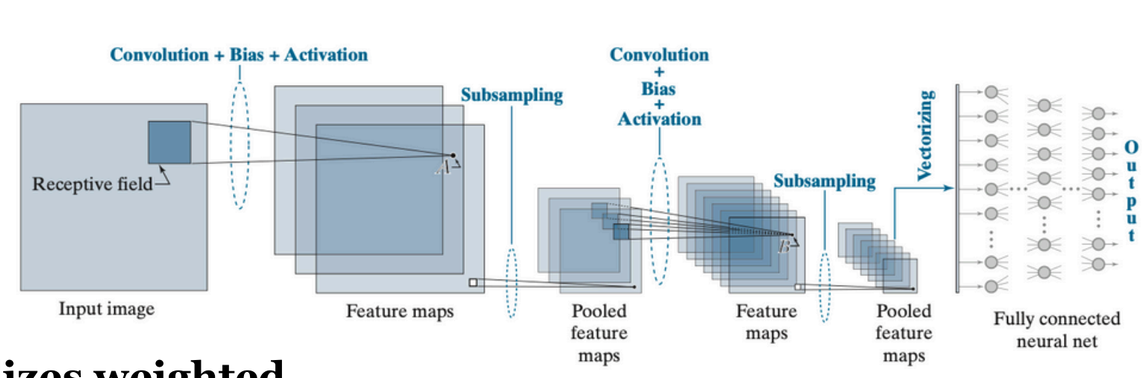
Gathering Data

Obtain 6,223 training & testing images using Kaggle and Python Web Scraping

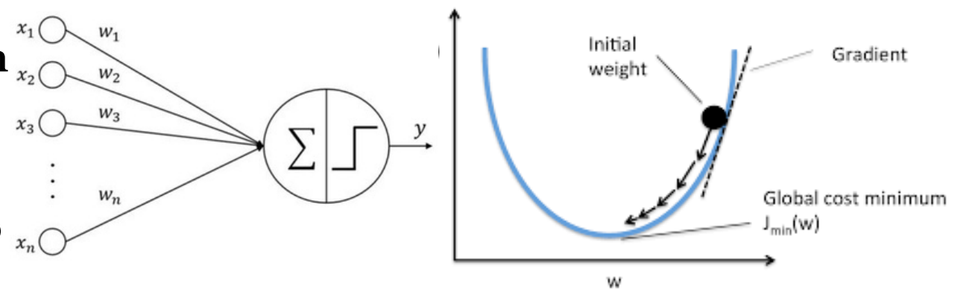


Training Model

Construct Convolutional Neural Networks classification model to predict species label

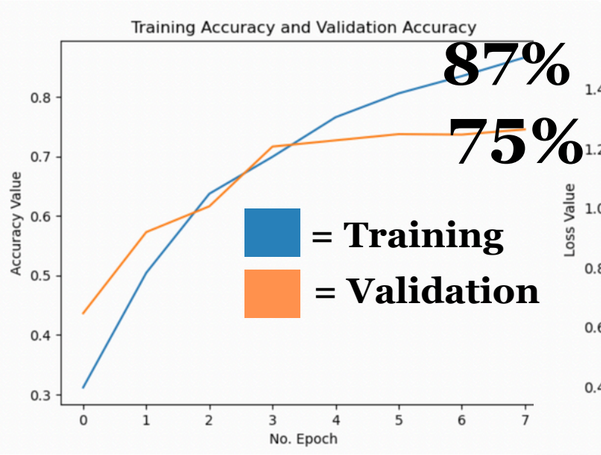


Utilizes weighted sums passed through activation functions and the gradient descent algorithm to predict species label



RESULTS

Accuracy: Training & Validation Data

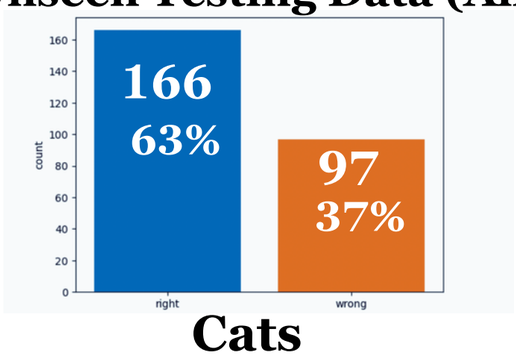


Loss: Training & Validation Data

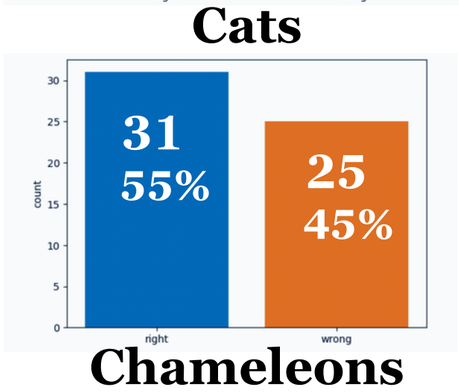
Predicted

Actual	Cow	Cat	Crocodile	Chameleon	Dragonfly	
Cow	41	6	1	2	1	0.19
Cat	4	31	3	14	4	0.21
Crocodile	6	5	20	11	14	0.21
Chameleon	2	5	0	38	9	0.20
Dragonfly	2	3	2	7	36	0.19
	0.20	0.19	0.10	0.27	0.24	1.00

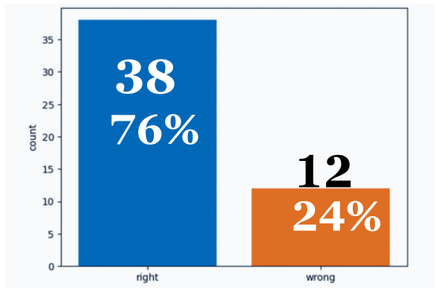
Quantity Predicted Correctly & Incorrectly for Unseen Testing Data (All)



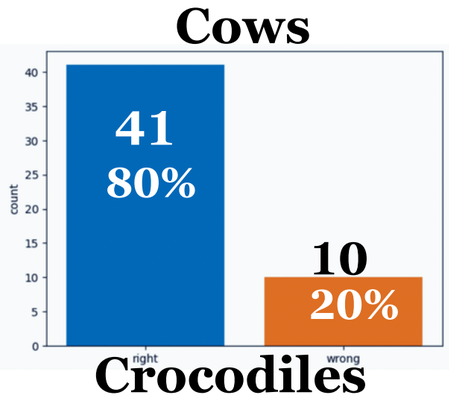
Cats



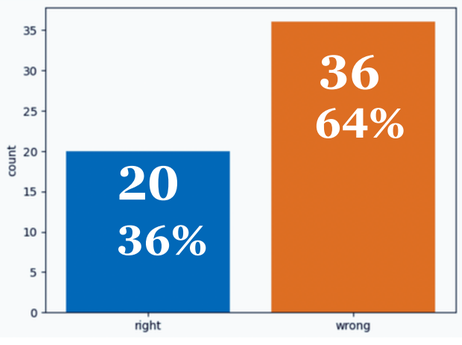
Chameleons



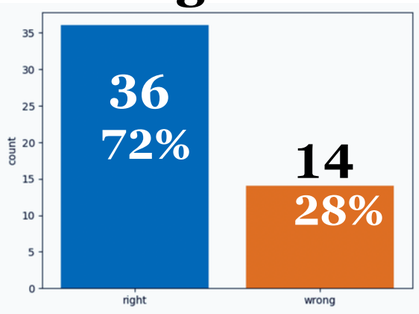
Cows



Crocodiles



Dragonflies



CONCLUSION

- Collecting thousands of images difficult
- High computation: upper limit for depth of Neural Network
- Highest Accuracy: Cow
- Lowest Accuracy: Crocodile/Alligator
- Model tended to overpredict Chameleon label
- Model tended to underpredict Crocodile Label
- More difficult for model to distinguish between species of similar shapes/colors