

# ALT TEXT FOR ALL

How deep learning can improve  
accessibility on Twitter

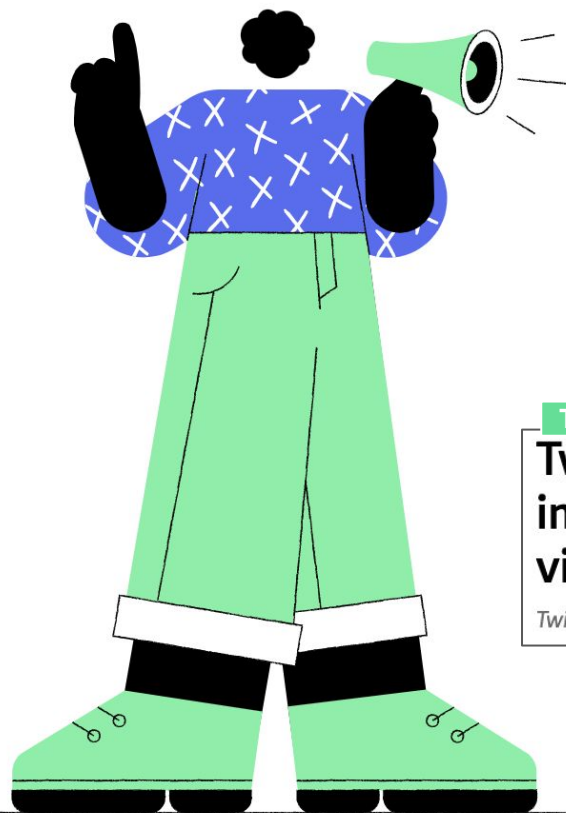


# WHAT IS ALT TEXT & WHY DOES IT MATTER?

- Alternative text is a textual description of rich content (e.g. images) on a webpage.
- It is read by screen readers in place of images allowing the content of the image to be accessible to those with visual or certain cognitive disabilities.
- Adding alternative text for images has been referred to as “the first principle of web accessibility.”

**As social media becomes increasingly prevalent and visual,  
making rich content accessible on social media is critical.**

# Twitter first released alt text support in 2016, and the announcement was met with great enthusiasm.



TechCrunch

**Twitter makes its service more accessible to the visually impaired**

Digital Trends

**You can now add a description to your Twitter pics to help the visually impaired 'see'**

The Verge

**Twitter now lets users add image descriptions to help the visually impaired**

*Twitter's taking new steps to improve image accessibility*

SocialMediaToday

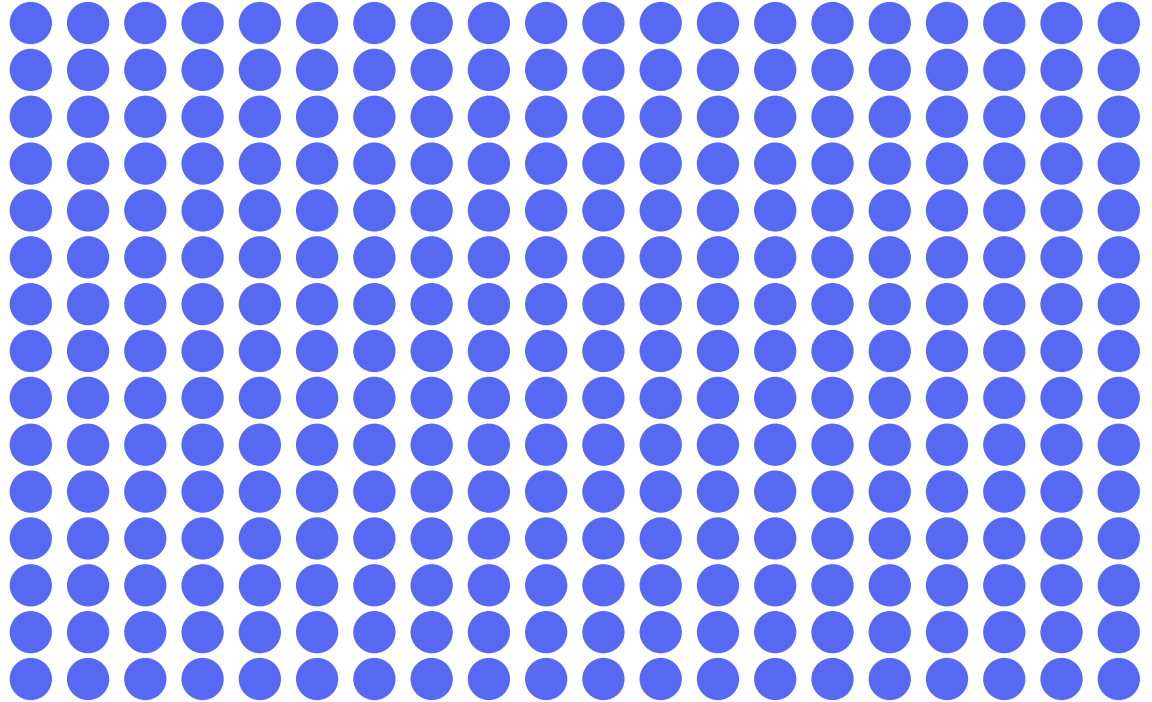
**Twitter Adds Alt-Text Image Descriptions to Extend Tweet Accessibility**

Vox

**Why you should use Twitter's new accessibility feature for blind users — even if you're not blind**

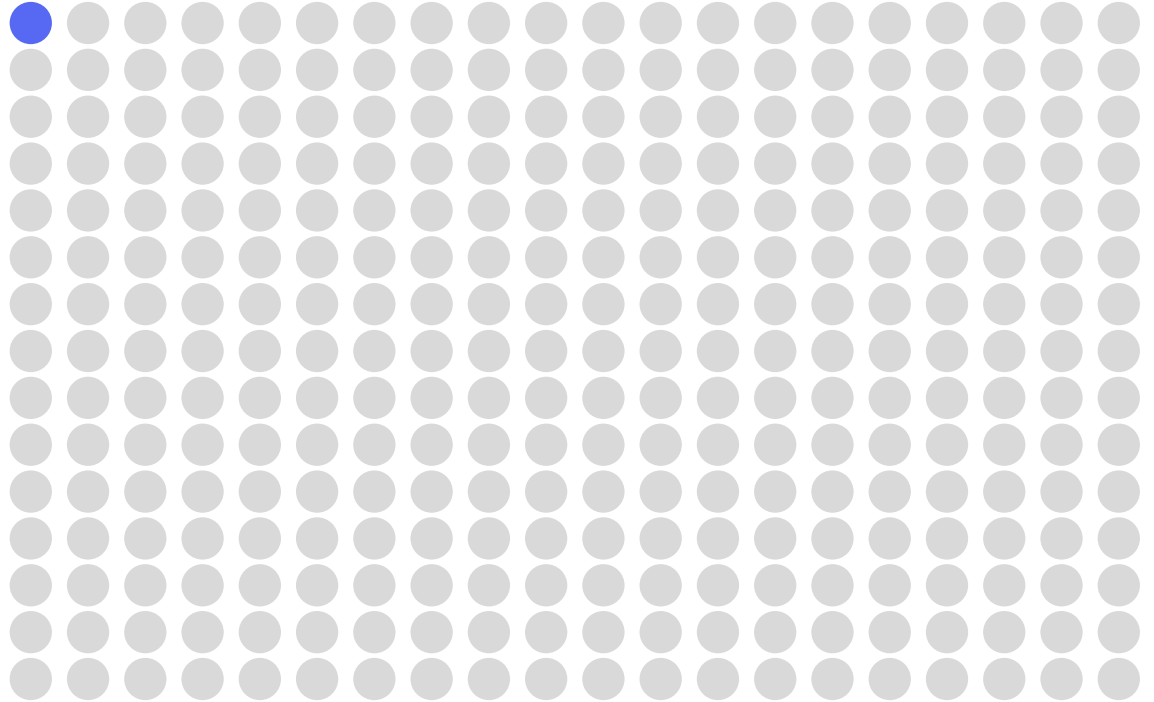
**BUT HAS  
ADOPTION  
CAUGHT  
ON?**

Out of 300 images shared on Twitter, how many would you guess have alt text?



**BUT HAS  
ADOPTION  
CAUGHT  
ON?**

Only 1 in 300 images shared on twitter has  
user-provided alt text.



# Why aren't twitter users adopting the alt text feature?

Don't  
know what  
alt text is

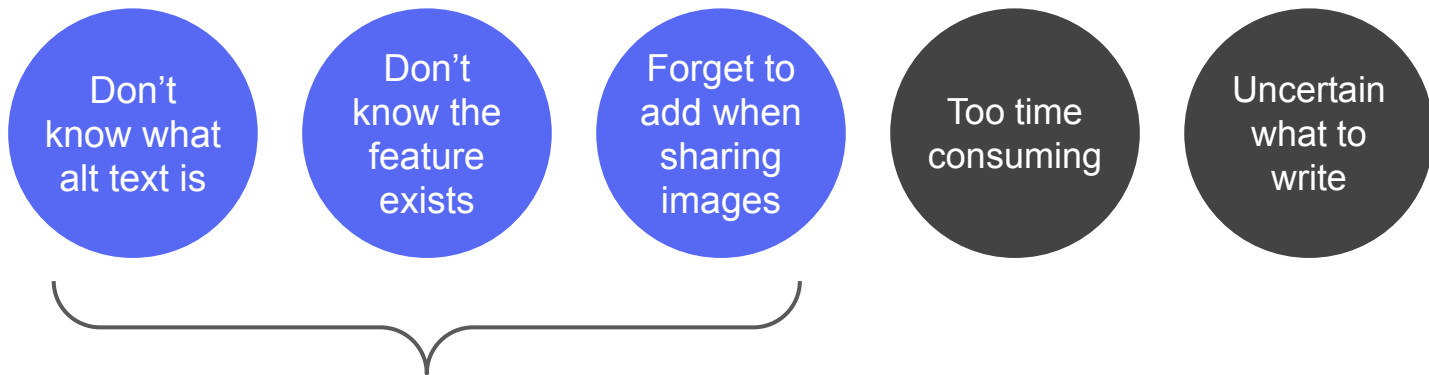
Don't  
know the  
feature  
exists

Forget to  
add when  
sharing  
images

Too time  
consuming

Uncertain  
what to  
write

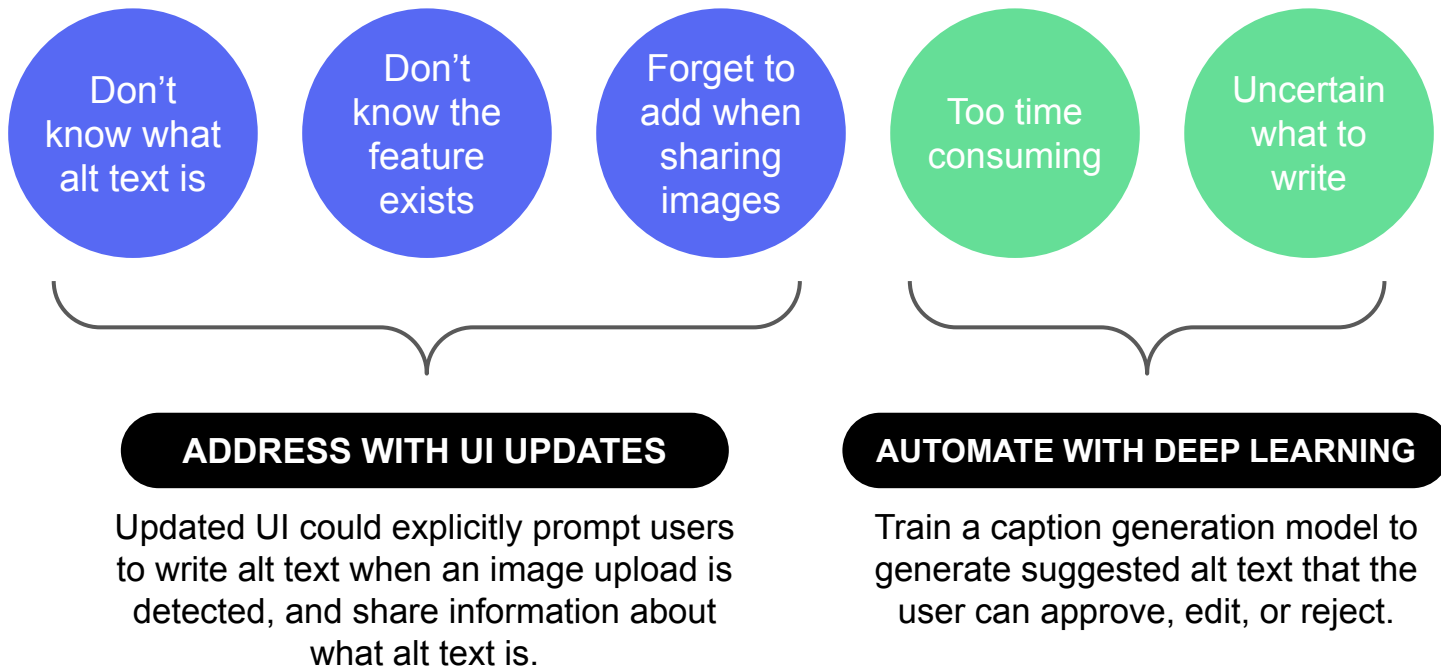
# Why aren't twitter users adopting the alt text feature?



## ADDRESS WITH UI UPDATES

Updated UI could explicitly prompt users to write alt text when an image upload is detected, and share information about what alt text is.

# Why aren't twitter users adopting the alt text feature?

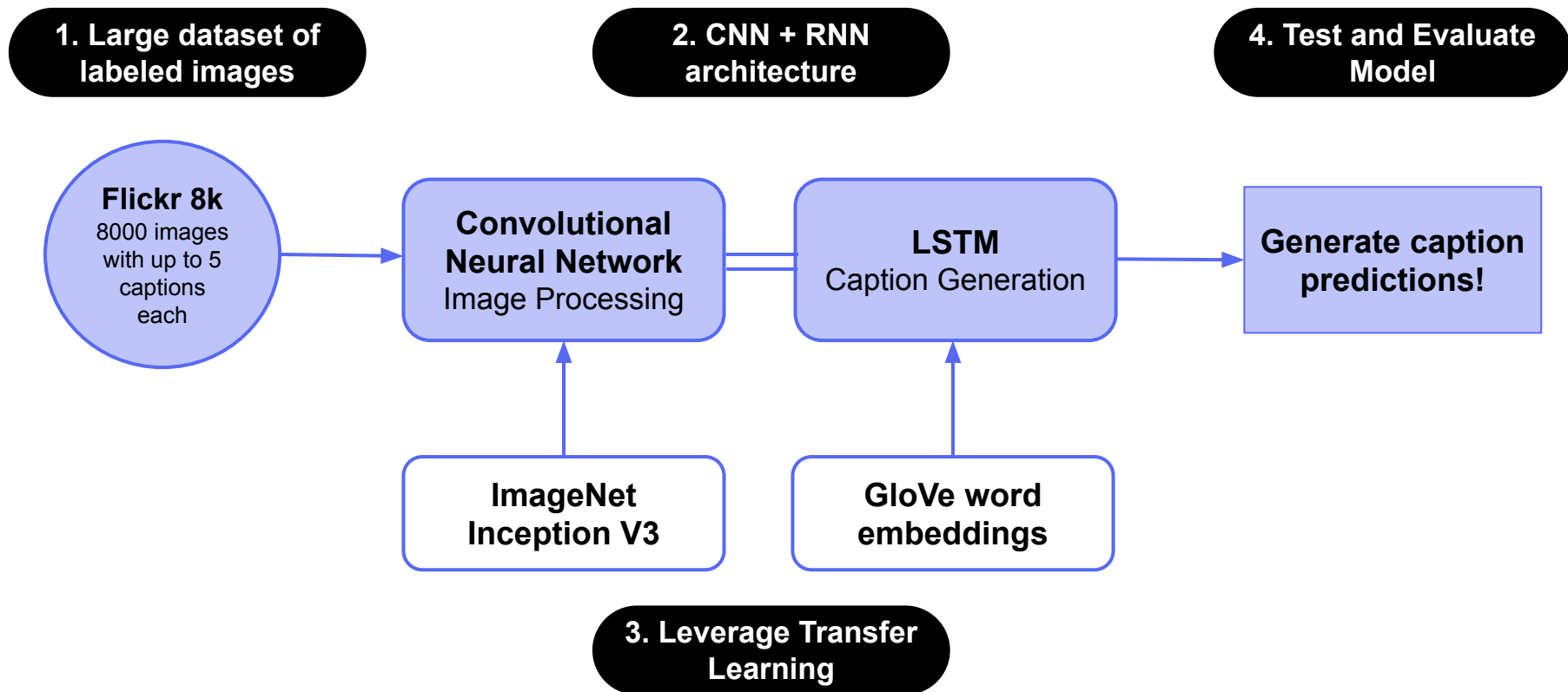




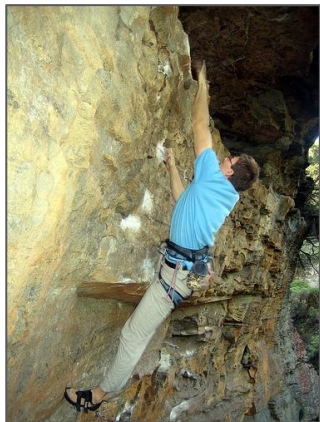
# BUILDING AN ALT TEXT GENERATION MODEL



# Modeling Workflow



# Model Performance on Flickr Test Set



Actual  
Caption

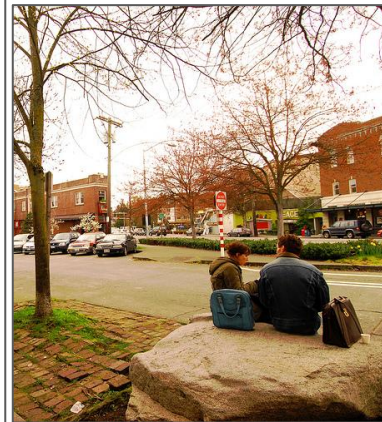
man in blue rock  
climbing



small white dog is running  
across grassy field



man wearing black shirt  
standing in front of red brick  
wall



two people sit on large  
rock near city street

Predicted  
Caption

man climbing  
rock wall

white dog with brown spots is  
running through the grass

man in black shirt and tie is  
standing in front of store

man in black shirt and  
jeans is walking past  
houses

Caption  
Rating

GOOD

GOOD

FAIR

POOR

# Model Performance on Twitter Images



Actual  
Caption

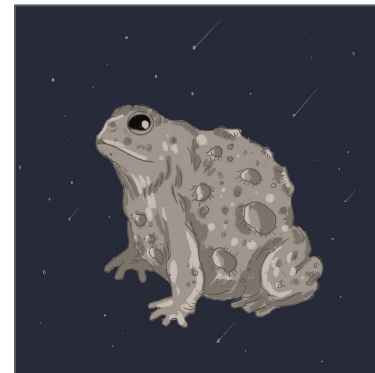
A husky puppy  
snuggles with a  
kitten.



A sweater with Dolly Parton  
dressed as Santa, captioned  
"tis the season to be Dolly"



My weird avatar standing by  
some mint green virtual armchairs



digital drawing of a toad, its  
skin made to look like the  
surface of the moon (stylized)  
on a starry background photo

Predicted  
Caption

two dogs are  
playing in the  
snow

woman with curly hair is  
holding violin and smiling

man in blue shirt is standing in  
front of building with his arms  
crossed

white dog is playing  
with multicolored stuffed  
animal

Caption  
Rating

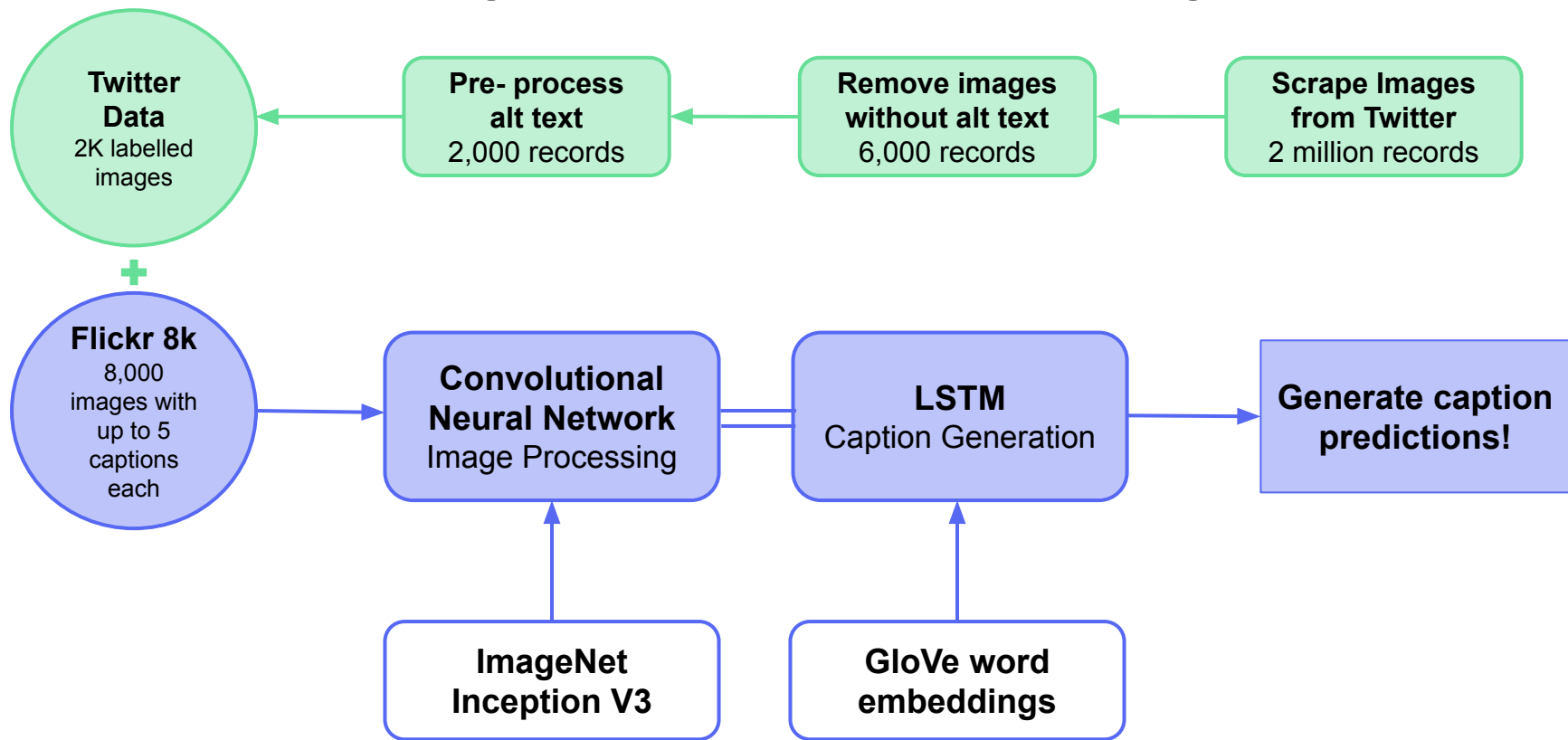
FAIR

POOR

POOR

POOR

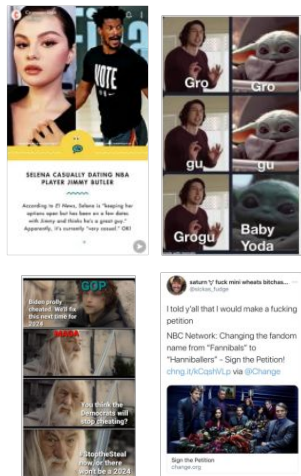
# Adding Twitter Data to Training Set



**Result: Twitter images too varied to be represented adequately in the small sample.**

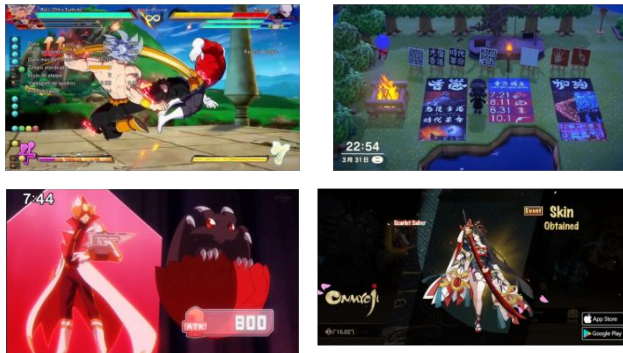
# What kinds of non-photographic images are common on Twitter?

## Text Screenscaps & Memes

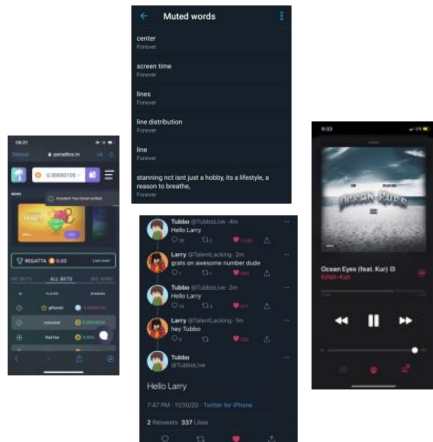


Clusters 16, 19

## Computer games



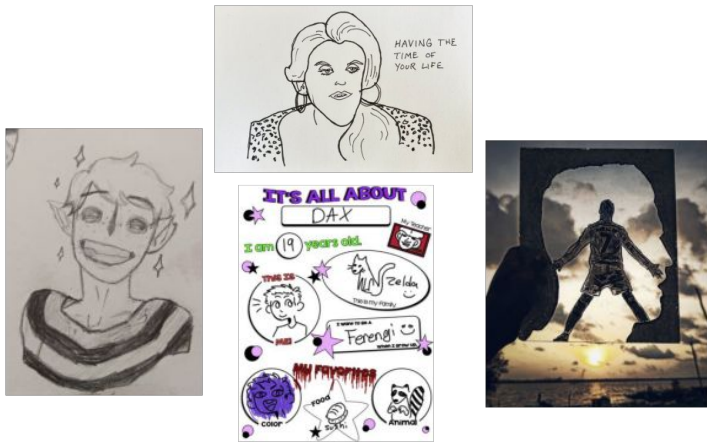
## Dark Mode Screenscaps



Clusters 2, 11

Clusters 9, 12

## Art



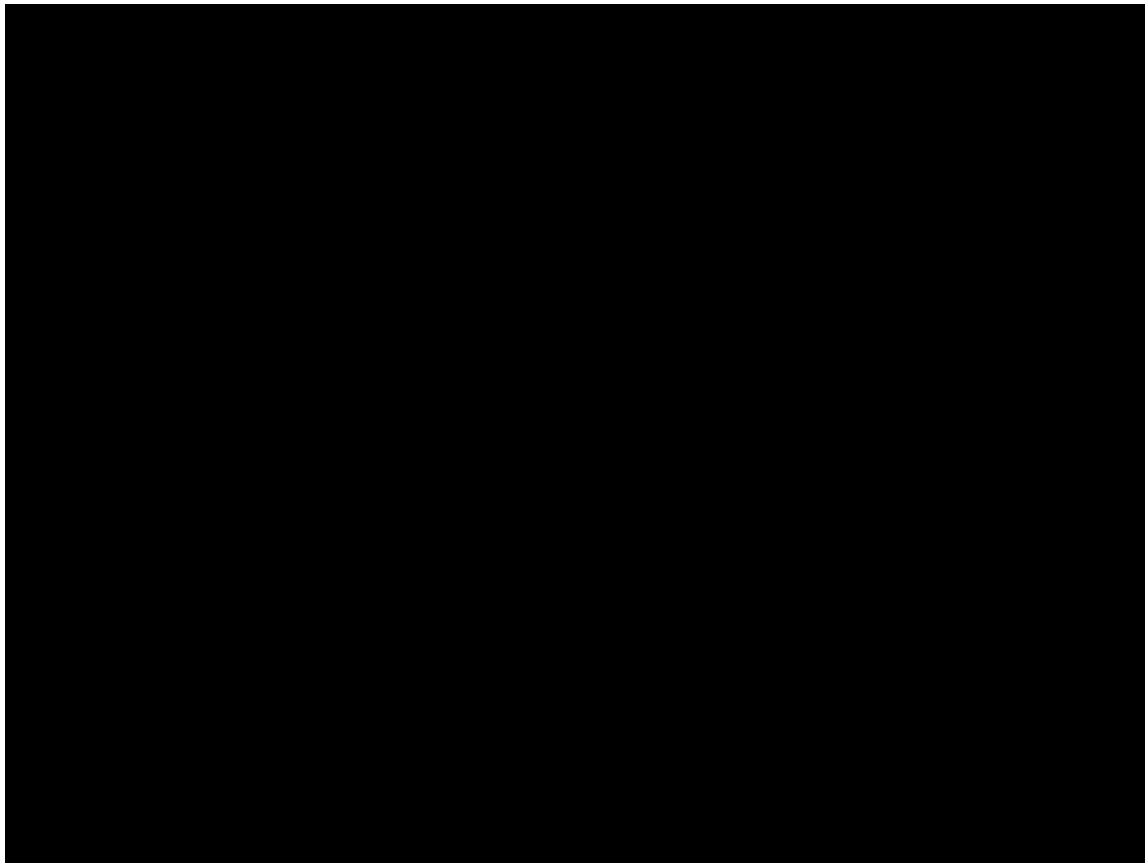
Cluster 7





# NUDGING USERS TO ADD ALT TEXT

# Proof of Concept: Chrome Browser Extension





# CONCLUSIONS

## DEEP LEARNING IS MOVING FAST

Image captioning models have made tremendous progress in just the past six years<sup>1</sup> with the growing accessibility of deep learning.

## OPPORTUNITY FOR SOCIAL MEDIA PLATFORMS

While creating big datasets for deep learning is typically difficult, social media platforms have massive extant datasets of user-labeled images.

## DESIGN NEEDS TO PRIORITIZE ACCESSIBILITY

The most significant barrier to alt text adoption is actually a lack of awareness of the feature. Accessibility features need to be prominent within the user experience.



# THANK YOU!

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