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Images + Words

Multimodal Data Analytics



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FUNDED BY:



Insight SFI Research Centre



4
Co-Lead Universities
4 partner institutions

Built on **20** years of
research in Data
Analytics and AI

450+
Academics, Postdocs, PhDs,
RAs

2700+
Scientific conference
and journal papers

160+
Funded collaborations
with industry partners

300+
Research Awards

12
Spin out companies
72 license agreements

150+
H2020 consortia, 580+
collaborations, 40
countries

1,137+ school
visits, 28,000 students

240+
PhDs graduated

Classification of offensive memes

Selena Gomez taking her music out for a walk



text features

image features

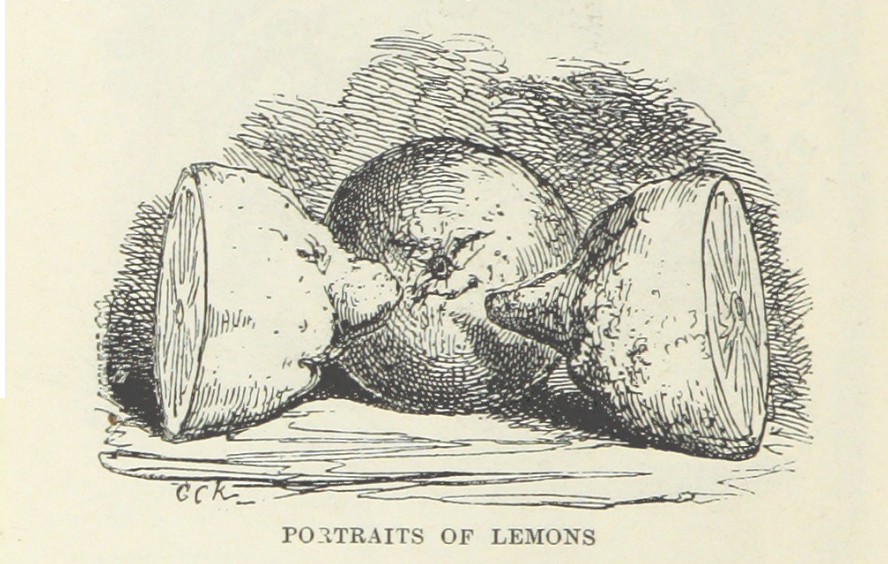
Offensive?

- Challenge: lack of labelled data
- Challenge: multiple meanings & context
- Fusion of text and image features
- Refining pre-trained models

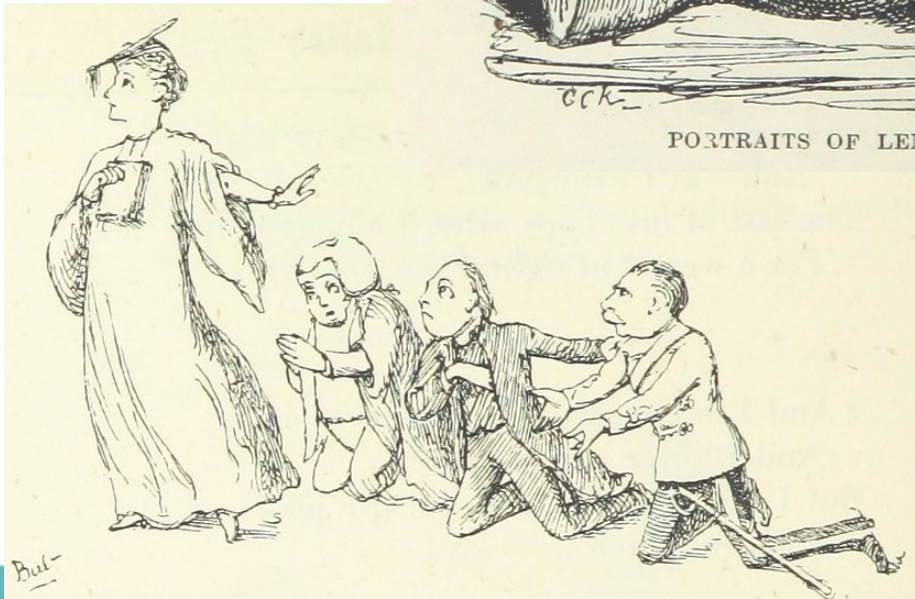
Suryawanshi et al. (2021) "TrollsWithOpinion: A Dataset for Predicting Domain-specific Opinion Manipulation in Troll Memes" <https://arxiv.org/abs/2109.03571>

Understanding historical comics

ill agree with us that it is a very brilliant and faithful imita



- 19th century “memes”
- The best computer vision models are trained on data like ImageNet or MS COCO → not comics
- What is a “face”?
- Who is that individual?
- Implication of caricature



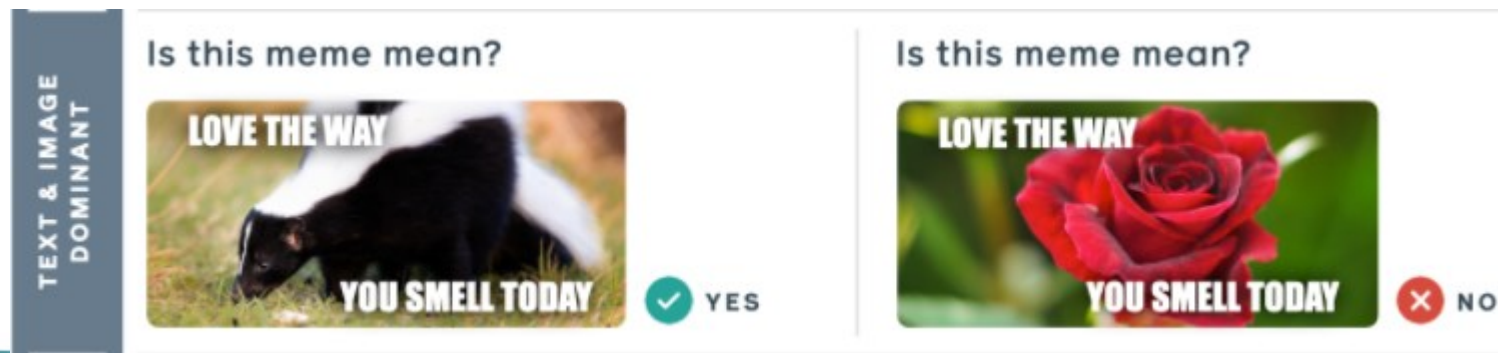
<https://www.flickr.com/photos/britishlibrary/albums/72157644238609190>

What do we do about data?

- [MultiOFF](#) (Suryawanshi): 743 [offensive/not offensive]
- [Memotion](#) (SemEval challenge): 7,000 [+ve/-ve/neutral, humour, sarcasm, offensive]
- [Hateful Memes](#) (Facebook): 10,000+ [hateful/not hateful]

Requirements:

- Volume
- Variety
- Labelled
- Context



Crowd4Access: a citizen science project



Take pictures of a footpath of your choice

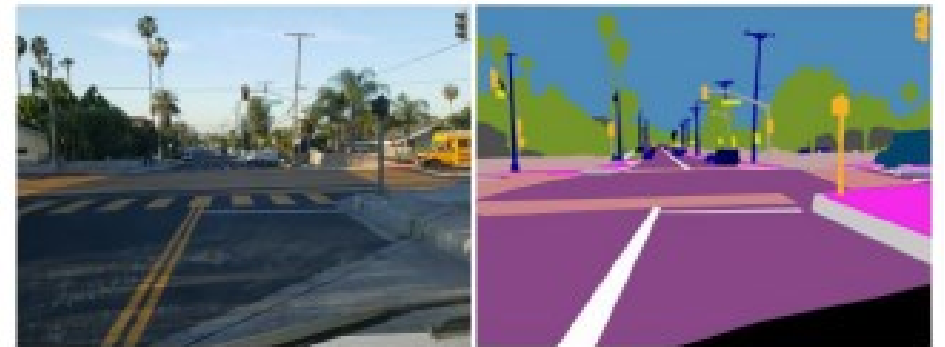
Do a survey of your neighbourhood and surroundings by taking pictures of the footpaths and street crossings.



Add a footpath on the map

Include information about the location of a footpath and street crossings. Describe also if there are lowered kerbs and tactile pavement, or the type of crossing.

- Crowdsourced data
- Image, location, classification
- Computer vision model for semantic segmentation



Crowd4Access: Venkatesh G M, B Pereira, S Little (2021) "Urban Footpath Image Dataset to Assess Pedestrian Mobility", Workshop on UrbanMM, ACM MM 2021

A thousand words ...

- Multimodal language data is rich and complex
- More than generating captions for images
- Applications in meme classification, knowledge extraction, hate speech detection, scene description, and many more
- Challenge: gathering and labelling sufficient data
- Challenge: contextual meaning as a continuum rather than binary

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