DETECTION OF THE TYPES OF IMAGES (PHOTOS, VIDEOS) PUBLISHED BY POLITICAL PAGES ON FACEBOOK

(Détection des types d'images (photos, vidéos) publiés par les pages politiques de Facebook)

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INTRODUCTION

PS
SOCIAL-ÉCOLOGIE

LA RÉPUBLIQUE
En Marche !

Rassemblement National

les Républicains

udi
union des démocrates et indépendants

PCF
PARTI COMMUNISTE FRANÇAIS

Les CENTRISTES

europe écologie les Verts

La France insoumise

GÉNÉRATION·S
le mouvement

OBJECTIVES

- To detect object in an image published by political parties or by the media.
- Compare different object detecting tools and state-of-the-art neural network models and their respective annotating methods.

OBJECT DETECTION

1. To enable analysis on political marketing with political objects such as.
    - Political Symbols
    - Meeting Context

OBJECT DETECTION

2. To detect types of images published by political parties to promote their candidates

3. To identify and quantify the main subjects of the images shared by the political communities.

PREVIOUS RESEARCH

'*A quick glance at an image is sufficient for a human to point out and describe an immense amount of details about the visual scene. However, this remarkable ability has proven to be an elusive task for our visual recognition models*' — (Karpathy & Fei-Fei, 2017).

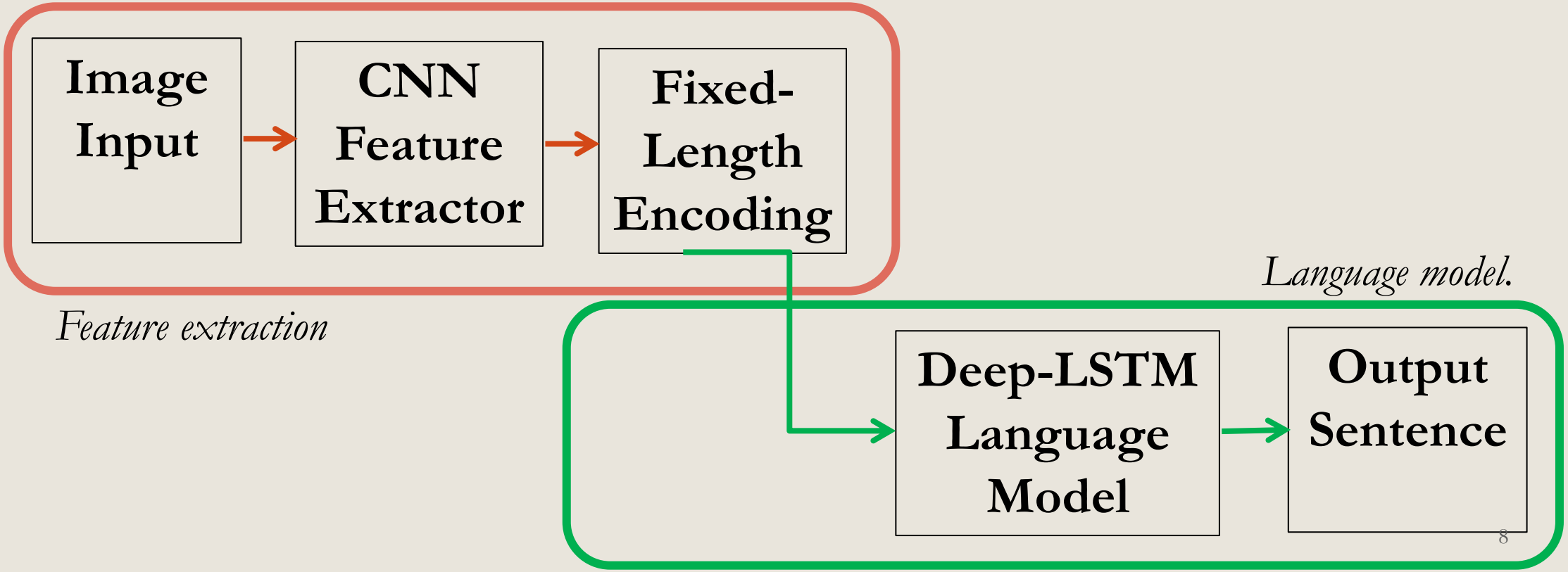
'*Automatically describing the content of an image is a fundamental problem in artificial intelligence that connects computer vision and natural language processing.*' — (Vinyals, et al., 2014).

PREVIOUS RESEARCH

- Template-based methods
- Nearest neighbor methods
- Modifying existing captions
- Neural network models

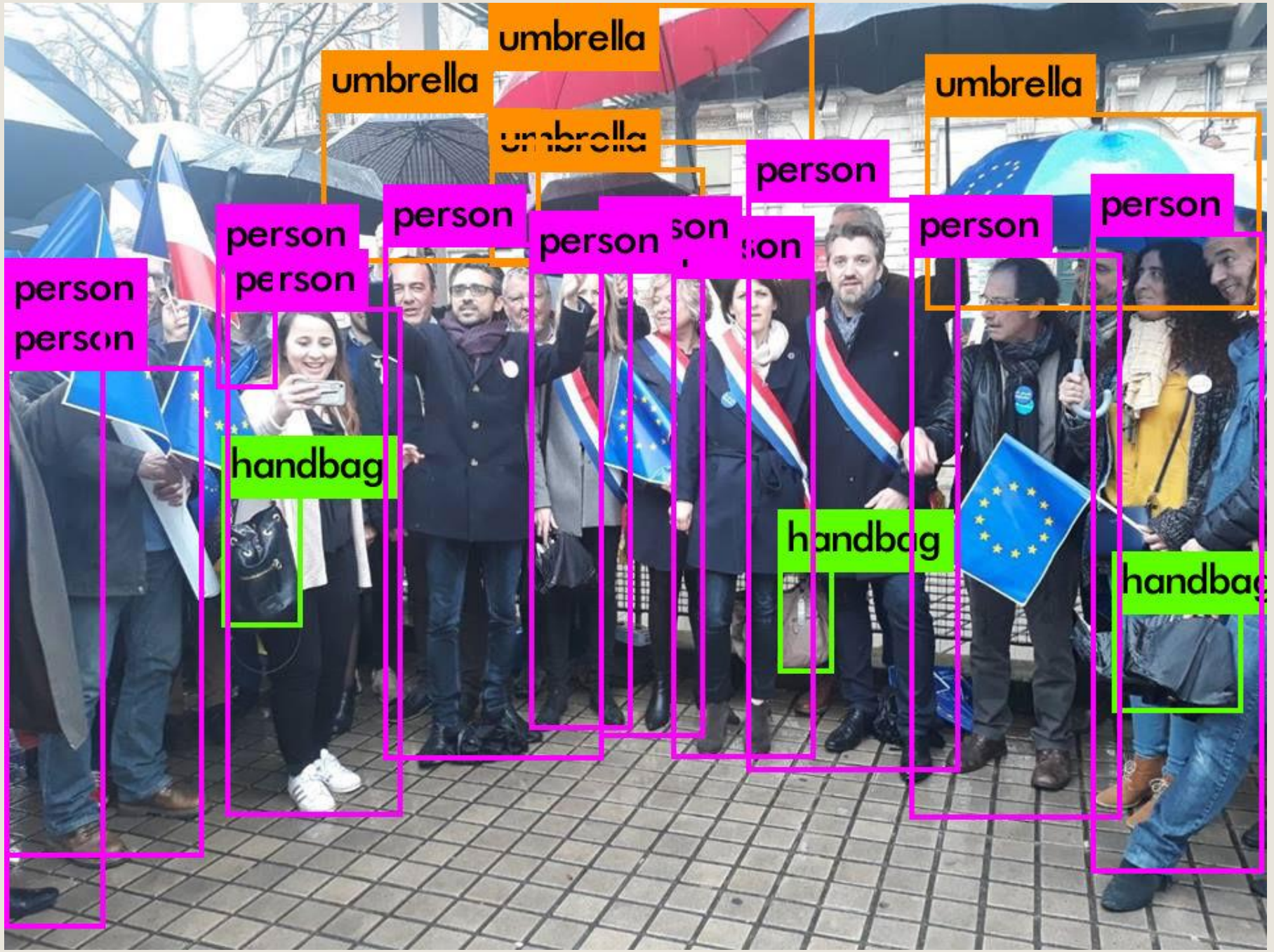
NEURAL NETWORK MODELS

- Feature extraction
- Language model.



AUTOMATIC IMAGE ANNOTATION

- Object detection and localization:


umbrella
umbrella
umbrella
umbrella
person
person
person
person
person
person
person
person
person
handbag
handbag

AUTOMATIC IMAGE ANNOTATION

- Object detection using CNN
  - One stage
  - Two stage
- Localization
  - Bounding box
  - Image segmentation

SOA CNN MODELS

- RetinaNet
- Deformable Part Models v5
- Region-CNN
- YOLO, YOLO9000, TinyYOLO, YOLOv3
- TensorFlow by Google AI
- Fast-CNN
- Faster R-CNN +++
- Faster R-CNN by G-RMI
- Faster R-CNN with FPN (feature pyramid network)

ANNOTATION TOOLS

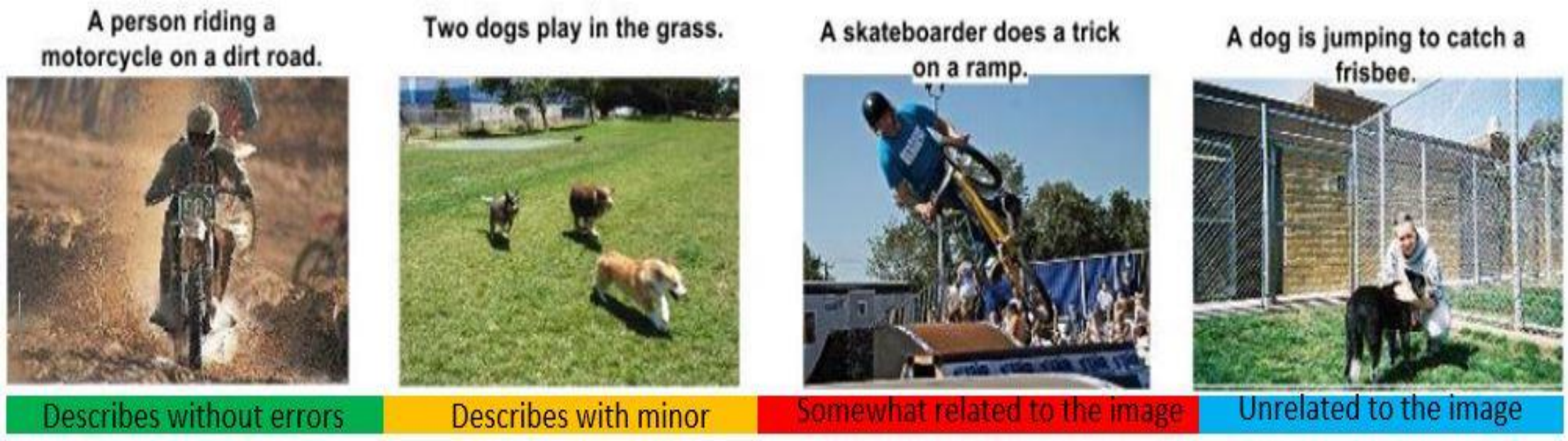
- Anno-mage
- LabelIMG
- LabelBox
- Supervise.ly
- Etc.

COMMON METRICS

- Mean average precision (mAP).
- Frame per second (FPS)
- Speed/Duration
- Multiscale prediction
- Backbone classifier

ANNOTATION TYPES WITH DEEP LEARNING TOOLS

1. Context-based Textual descriptions/Caption



ANNOTATION TYPES WITH DEEP LEARNING TOOLS

2. Descriptions of image regions

ANNOTATION TYPES WITH DEEP LEARNING TOOLS

3. Description/classification of image into known class

CONCLUSION

Different models will be identified and their annotating strengths and cons will be documented.

To identify the main subjects of the photos/images in order to compare them with the topics of Facebook posts that the lexicometric analysis (the topics model) has been identify.

(This analysis is to be done by Julien Figeac and Pierre Ratinaud.)

CONCLUSION

Still not easy-peasy for computers!

sharpei
or
croissant?

CONCLUSION

Still not easy-peasy for computers!

teddy bear
or
cute dog

OPEN QUESTIONS

- Can we identify the topics of the images ? : - Social movements, riots, strikes
  - Terrorist events
  - Economic events (taxes, fraud scandal, etc.)
- Can we analyse the images when it centered on a person (top of the body, face)?
  - Body language?
  - Gender?
- Public gatherings and events?
  - Important public events (e.g. "Agricultural exhibition in Paris" and other public events where politicians are present)

REFERENCES

- Everingham, M. et al., 2009. The PASCAL Visual Object Classes (VOC) Challenge. *International Journal of Computer Vision manuscript,* p. 34.
- Karpathy, A. & Fei-Fei, L., 2017. Deep Visual-Semantic Alignments for Generating Image Descriptions. *IEEE Transactions on Pattern Analysis and Machine Intelligence,* 39(4), pp. 664-676.
- Scaaaaryghost "Deep Learning Training sets" Imgur, 11 May 2016. https://imgur.com/a/K4RWn. Accessed 05 june 2009.
- Redmon, J., Divvala, S. K., Girshick, R. B. & Farhadi, A., 2015. You Only Look Once: Unified, Real-Time Object Detection. *CoRR,* Volume abs/1506.02640, pp. 1-10.
- Redmon, J., 2016. *'You Only Look Once' Real-time detection.* Califonia, Conference on Computer Vision and Pattern Recognition.
- Russakovsky, O. et al., 2013. Detecting Avocados to Zucchinis: What Have We Done, and Where Are We Going?. *IEEE International Conference on Computer Vision,* pp. 2064-2071.
- Vinyals, O., Toshev, A., Bengio, S. & Erhan, D., 2014. Show and Tell: A Neural Image Caption Generator. *CoRR,* p. 9.