Visual Question Answering

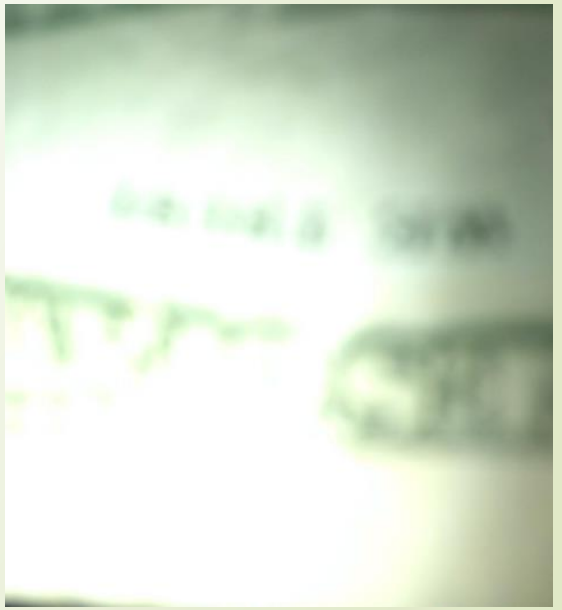
with image captions

Motivation

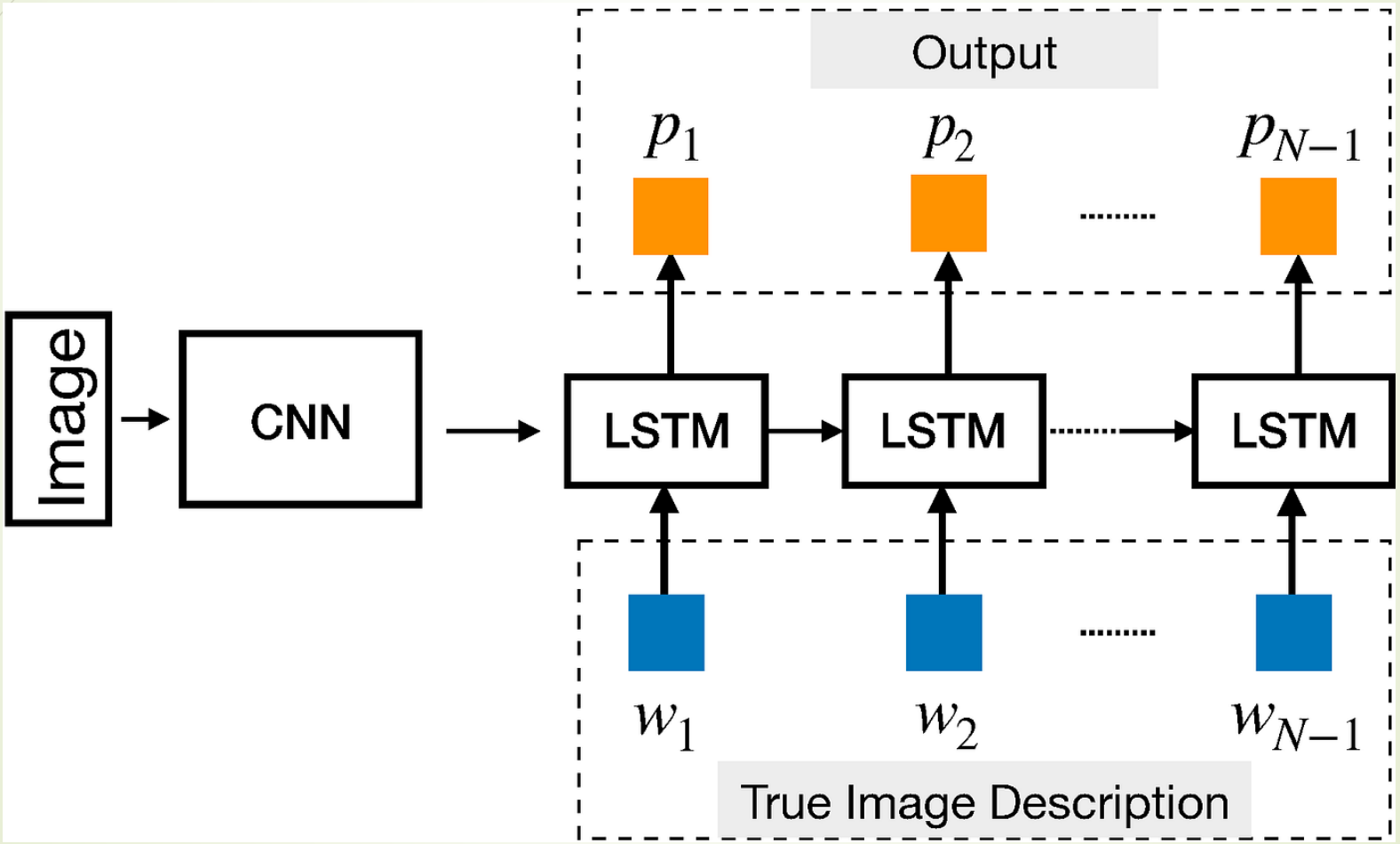
Develop a computationally cheap model for visually impaired people.

Datasets

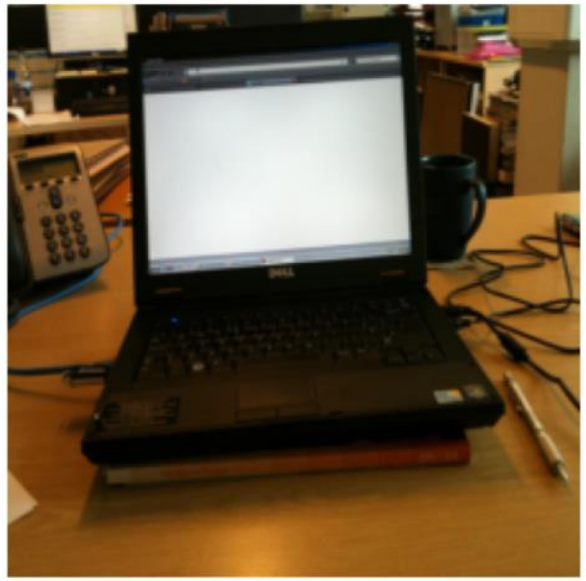
- MSCOCO Captions
- VizWiz



Modeling Image Captions



Results



Generated Caption: [UNK] [UNK] [UNK] [UNK] [UNK] [UNK] [UNK] [UNK]

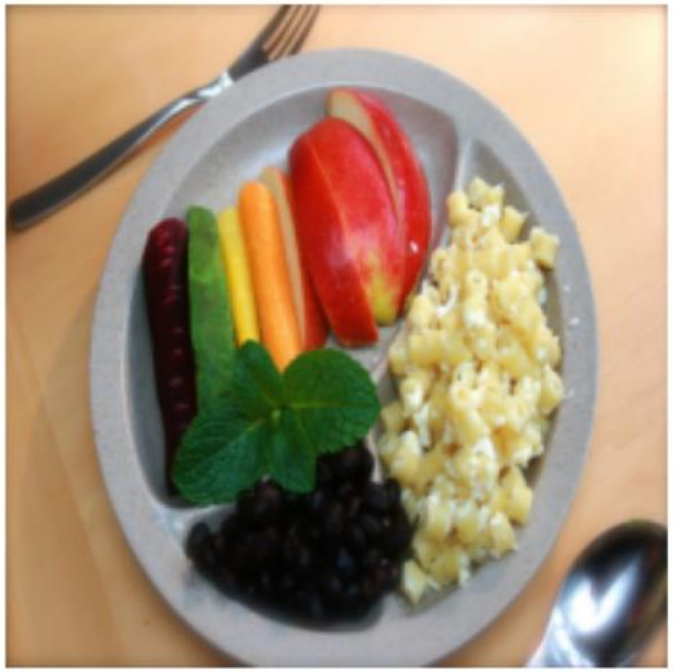
Generated Caption: a a a a a a a a a a

Most prob

Generated Caption: a plate of with with a a a a .

Generated Caption: a man of a a a a a a .

K-prop



Generated Caption: a plate of of with

Generated Caption: a man riding a a

Most prob

K-prop

Generated Caption: a man with a a a a a a .

Generated Caption: an bathroom is with on

Generated Caption: a man of a a a a a a .

Generated Caption: a group of a in a the in a

VQA Model

- Generate image captions with vit-gpt2-image-captioning transformer
- Vision Transformer fine-tuned on ImageNet(base-sized model)
- Bert Tokenizer (questions, captions)
- Bert Model -> embeddings for questions and captions
- GPT Tokenizer (answers)
- Fusing questions, captions and image features
- GPT for generation of open-ended answers

Results

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Validating:   1%|█                                                                    | 1/103 [00:00<00:36,  2.82it/s]
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Challenges and Future work

- No good results
- Hard to answer open-ended questions without multi-classification

- Using only GPT and exclude BERT
- Trying this model on less noisy data
- Maybe trying to improve the image captioning model

References

- https://arxiv.org/pdf/1505.00468
- https://arxiv.org/pdf/1603.02814v2
- https://arxiv.org/pdf/2311.00308

Thank you. Questions?