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Multimodal Inverse Cloze Task for Knowledge-based Visual Question Answering

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We present a new pre-training method, Multimodal Inverse Cloze Task, for Knowledge-based Visual Question Answering about named Entities (KVQAE, [2]). KVQAE is a recently introduced task that consists, as illustrated by Figure 1 in answering questions about named entities grounded in a visual context using a textual Knowledge Base. Therefore, the interaction between the modalities in this task is paramount and must be captured with complex fusion models. As these models require a lot of training data, we design this pre-training task from existing work in textual Question Answering [1]. It consists in considering a sentence as a pseudo-question and its context as a pseudo-relevant passage and is extended by considering images near texts in multimodal documents. Our method is applicable to different neural network architectures and leads to a 9% relative-MRR and 15% relative-F1 gain for retrieval and reading comprehension, respectively, over a no-pre-training baseline.



Visual Question (input)	Relevant visual passage in the Knowledge Base
 <p>“Which constituency did this man represent when he was Prime Minister?”</p>	 <p>“Macmillan indeed lost Stockton in the landslide Labour victory of 1945, but returned to Parliament in the November 1945 by-election in Bromley.”</p>

Fig. 1: Example of a question about a named entity with a visual context along with relevant passages from a Knowledge Base.

Keywords: Visual Question Answering · Named Entities · Pre-training · Multimodal Fusion.

References

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