Problem statement

We plan to focus on Text Infilling, filling missing text snippets of a sentence or paragraph. Preforming it well can be useful in numerous contexts, such as restoration of historical or damaged documents, contract or article writing with templates, text editing, and so forth.

Relevant work

State of the art performance is achieved by TIGS[5], an inference algorithm for Text Infilling with gradient search. They used a pre-trained RNN based model and implemented their algorithm during inference, while we plan to change the base model architecture.

Proposed method

Conditional Neural Processes (CNP)[2] is a novel framework suggested by DeepMind for regression and classification tasks that combines the strengths of neural networks and Gaussian processes. Similar to GP, CNP learns distributions over functions and predict their uncertainty about the predicted function values. But in contrast to GP, CNP scale linearly with the number of data points, while GP typically scales cubically. CNP and its generalizations have shown to be a powerful tool in the domain of computer vision[3][1]. In this project, we aim to use CNP for text infilling, as the power of CNP in this field has not been explored yet. We believe that CNP can help yield competitive results since it has shown good performance on completion tasks in other domains.

CNP has three main components: Encoder, Aggregator and Decoder. The encoder will be used to encode contextual information about the data, the aggregator acts on the encoded data and aggregates it to one vector representation. This vector is then used alongside the position of the missing word(s) as input for the decoder that outputs the missing word.

Dataset

We plan to evaluate our work on the DailyDialog [4] dataset, which contains 82,792 conversation pairs. The query sentence is taken as encoder input x, and the reply sentence is taken as y.

Evaluation

We will evaluate our results with standard sentence-level metric BLEU score. and compare it to the results reported in TIGS[5].

References

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