Leveraging Order-Free Tag Relations for Context-Aware Recommendation

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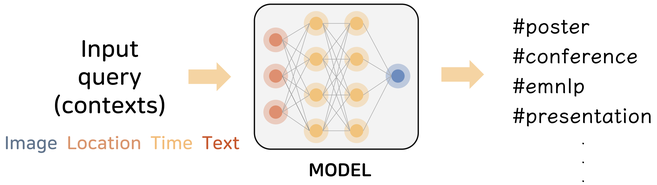
TASK Context-Aware Tag Recommendation

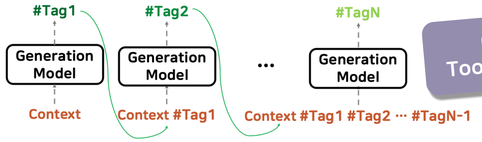


Intuition

Hashtags within a post are related to each other (*inter-dependency*), but the order in which they occur doesn't matter (*orderlessness*).

Previous approaches

Ranking Problem:
Rarely consider the inter-dependency



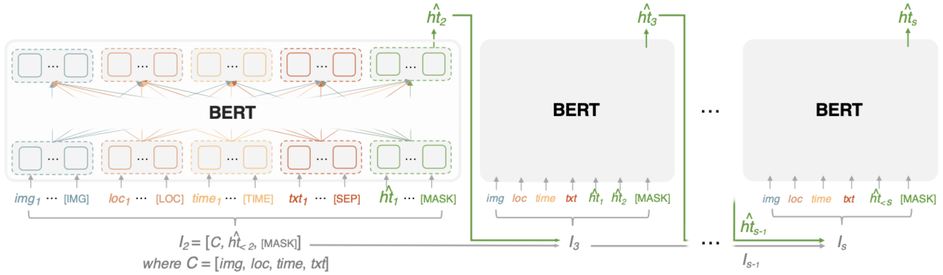
Generation Problem:
Too dependent on the order

Our approach Sequence-Oblivious Generation (SOG)

To alleviate the order impact
while leveraging inter-dependent tag relations

Three key choices devised for tag generation, unlike conventional text generation

1. Model Structure: Encoder-Based Generation

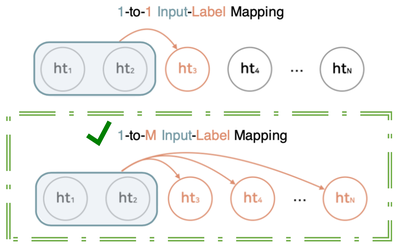


Decoder (Autoregressive, AR): Left-to-right / last token for generating the next tag
(dependent on the last one)

vs.

✓ SOG (Encoder): [MASK] token for generating the next tag (Identical flow)

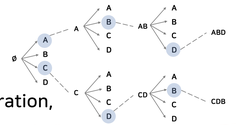
2. Training: 1-to-M Optimization



Not necessarily ht3 right after ht2

Optimize using multi-labeled distribution

3. Sequence-Oblivious Decoding



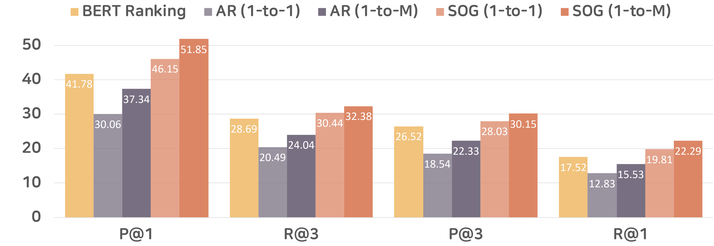
De facto in text generation, maximizing the likelihood of sequence (global)

*Recommendation Task: Most relevant items first

vs.

Optimal for hashtag generation (ranking task), producing most likely hashtag at each step

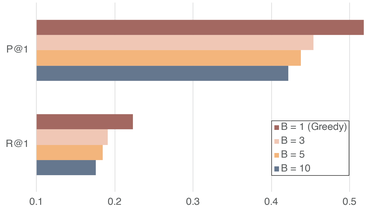
Results Instagram Dataset (P@K, R@K)



SOG architecture outperforms both ranking and standard generation

1-to-M training significantly improves further

The order in a hashtag sequence does not matter



Greedy decoding is much better than beam search for tag generation

Takeaways

- Tag information is certainly useful, but the order does not matter
- SOG can alleviate the order impact while leveraging tag relations
- SOG is superior to ranking and conventional generation