CS224n : NLP with deep learning

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Week 8

Lecture 15 : Natural Language Generation (NLG)

- Translation
- Summarization
- Dialogue
- Creative writing
- Freedom answering

Teacher forcing : feed the golden (reference) target into decoder regardless of last step decoder's output

search algorithm:
- greedy search (argmax)
- beam-search (k top)

What's effect of changing "k" in beam search :

- Small k close to greedy decoding
  - ungrammatical, unnatural
- big k more hypothesis
  - computational expensive

NMT • decrease BLUE score (too many short translations)

open-ended tasks • large k — more generic

Sample-based decoding :

- pure sampling : on each time t, randomly sample from the probabilty distribution P_t
- Top n sampling : randomly sampling restricted to top-n most probable words

Softmax temperature

τ : temperature hyperparameter

$$P_t(w) = \frac{\exp(S_w/\tau)}{\sum \exp(S_w/\tau)}$$

— raise temperature : Pt more uniform
— decrease temperature: Pt more spiky

Sec 2: NLG tasks and neural approaches to them

· Summarization : shorter sentence with main information

Extractive Summary	Abstractive Summarization
easy contrained	difficult flexible

ROUGE scoring

Neural Summarization:

· Single-document abstractive summarization is translation tasks

Dialogue: △ Task-oriented · Assistive
· Co-operative
· Adversarial

△ Social dialoge · chit-chat
· Therapy

· Irrelevant response problem — optimize MMI (maximum Mutual Information)

· Generic / boring response problem

· Repetition problem

sec 3. NLG Evaluation

need a more focused automatic metrics

human evaluation is very subjective, inconsistency

Lecture 16 : Reference in Language and Coreference Resolution

- What is coreference resolution?

  Identify all mentions that refer to the same world entity.

Applicants : • Full text understanding
• Machine translation (gender, number, dropped pronouns)
• Dialogue system

steps : [A] Detect the mention — Pronouns、Named Entity、Noun phrase

[B] resolve the mention
- anaphora
- bridging anaphora
- cataphora

Four kinds of Coreference models

- Rule-based — hobb's algorthm
- Mention-pair — binary classifier, assign every pair a Probability
- mention ranking
- Clustering

Problem: knowledge-based Pronomial Coreference