

# Open-domain Dialogue Generation: What We Can Do, Cannot Do, And Should Do Next

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## Types of Dialogue Systems

- Retrieval-based systems
  - Select a suitable response from a dataset
  - Safe and fluent
  - Limited response options
- Generative systems
  - Generate text
  - Less safe, but more flexible
- Comprehensive systems
  - Employ a dialogue manager
  - Consist of multiple individual components

## Training and Data Augmentation

- General training
  - Different strategies according to the type of system
- Pretraining
  - Option 1: First pretraining on large unlabeled corpora, then finetuning on dialogue data
  - Option 2: First pretraining on large dialogue corpora, then finetuning on out-of-domain dialogue data
- Data augmentation
  - From unlabeled data in the form of unpaired dialogue data
  - Automatic generation of dialogue data

## Common Errors of Dialogue Systems

- Turn level
  - Ungrammatical responses
  - Nonsensical responses
  - Echoing of the user
- Conversation level
  - Responses that are irrelevant in the conversation's context
  - Overly generic responses
  - Lack of consistency across turns
- System level
  - Lack of world knowledge and common sense
  - Lack of factuality

## Ethics, Bias, and Fairness

- Safety: no harm to the user
  - Attempts have been made to detect sensitive language around religion, race, violence, or profanity
  - Unclear how to respond to such topics
  - Dinan et al. (2021) identify three potentially dangerous behaviors: *instigator*, *yea-sayer*, *imposing as an expert*
- Biases
  - Dialogue systems learn undesirably biases from the data they are being trained on
  - Different debiasing techniques have been proposed

## Open Challenges

- Model evaluation and analysis
  - Appropriate metrics for dialogue are needed
  - What world/linguistic knowledge and biases do models learn?
- Multi-party dialogue
  - How can we extend systems to multi-party dialogue?
- Multilingual dialogue
  - With few exceptions, datasets are in English or Chinese only

For details, information about datasets, and references to prior work please refer to our paper!