A Unifying View On Task-oriented Dialogue Annotation

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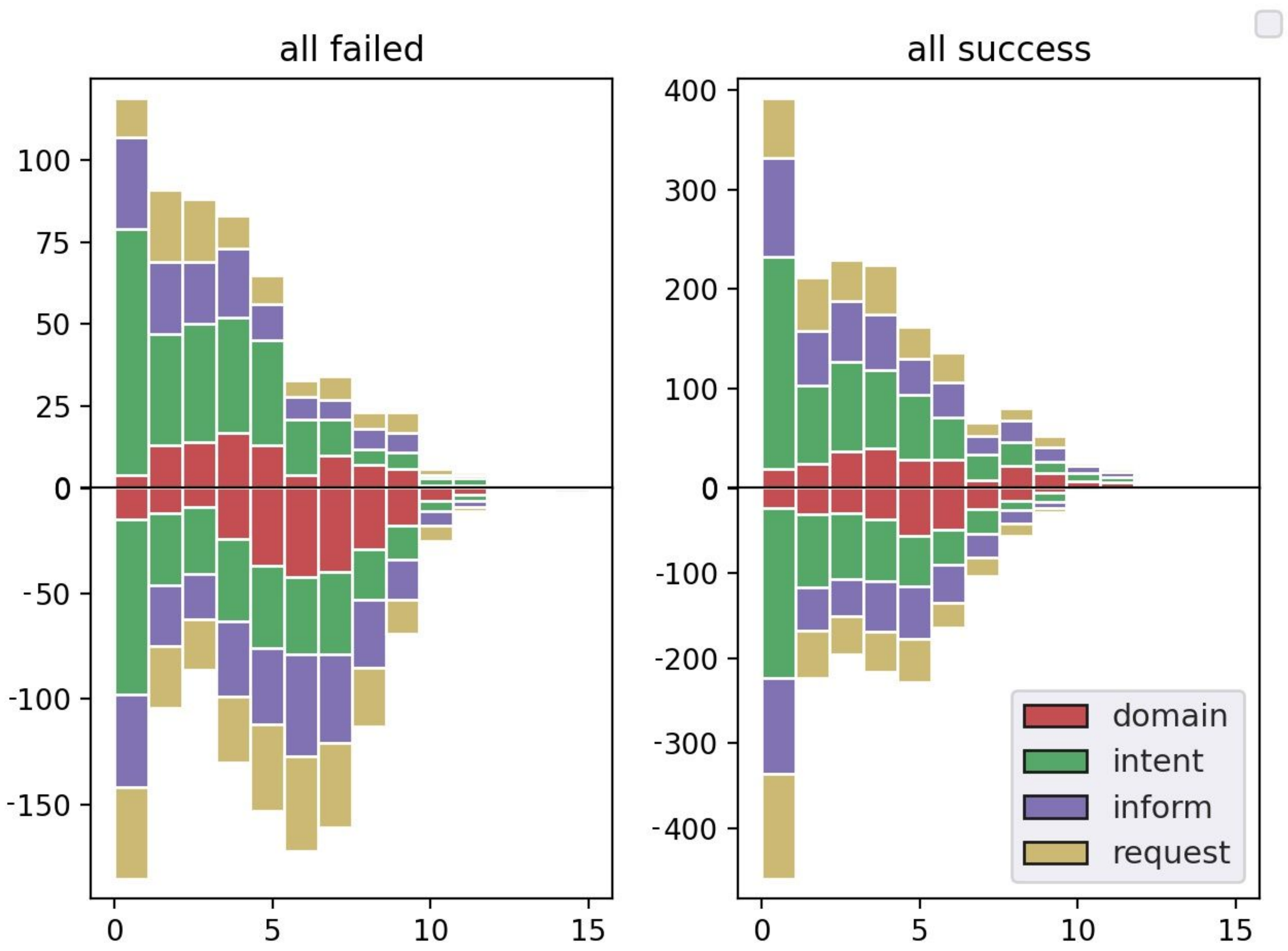
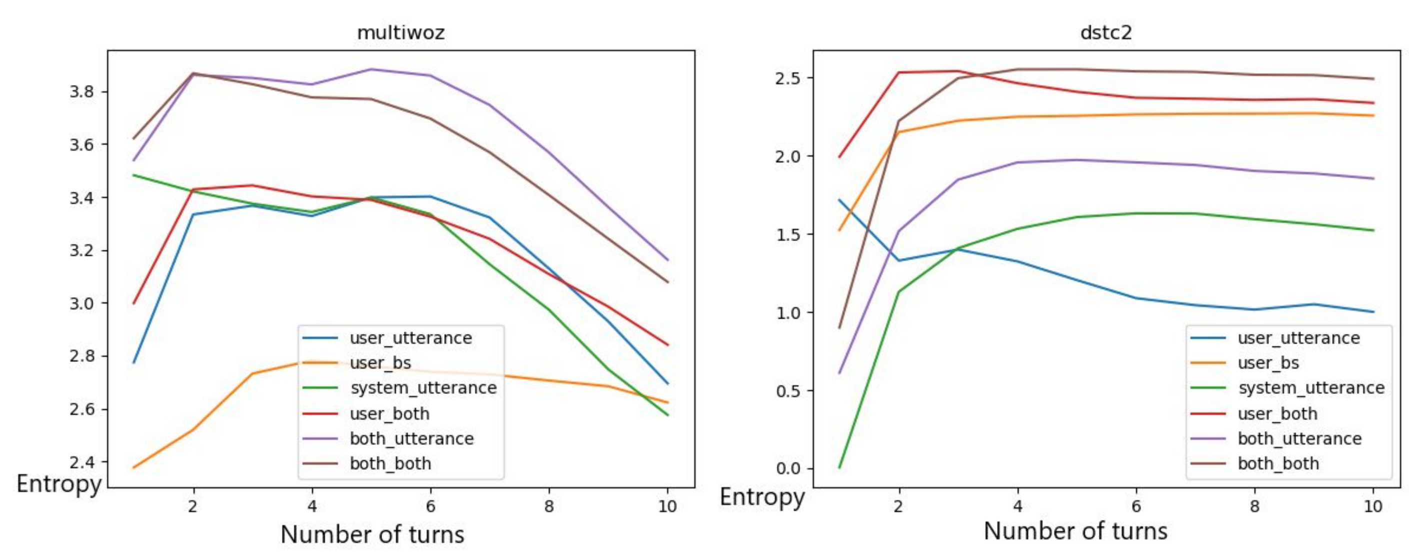
Overview

- Unifying annotation & ontologies in 4 task-oriented dialogue datasets:
  - **MultiWOZ, SGD, DSTC2, CamRest**
  - → one of the largest annotated sets to date
- Data analysis and visualization
- Baseline model training and comparison

Success/failure analysis



Conditional entropy



Analysis

- **3 dialogue phases** (based on conditional entropy)
  - information growth, stagnation, information deprecation
- **Human-human vs. human-machine** entropy evolution differs
- Most **dialogue failures** due to missing information
  - Recoverable
  - It is correlated with entropy evolution.
- **Best model** – trained on full data
  - SGD → better BLEU
  - MultiWOZ → better state tracking

Data Statistics

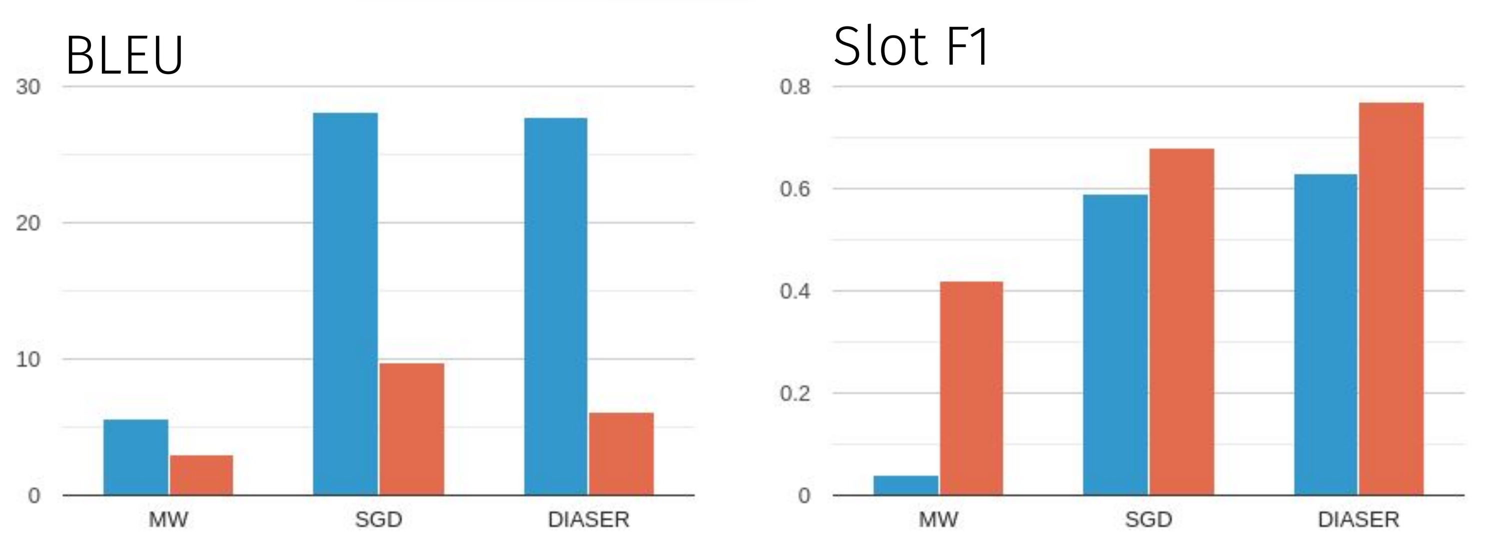
	SGD	MultiWOZ	DSTC2	Camrest	Total
Domains	18	7	1	1	19
Slots	145	29	10	7	166
Dialogues	22.8k	10.4k	3.2k	700	37.1k
Avg. utt. length	9.9	13.2	8.5	10.7	10.5
Entropy	4.8	4.4	2.1	3.0	4.8

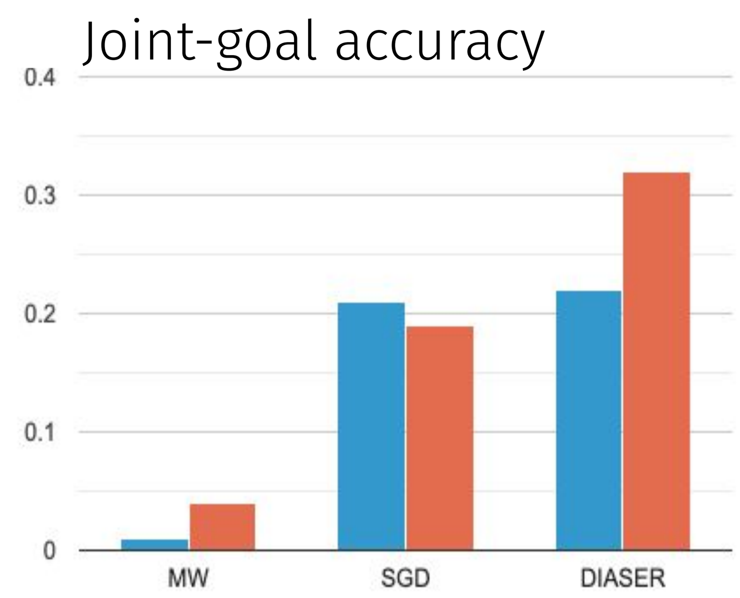
Example

dialogue_id: MUL0674.json, **original_dataset**: multiwoz, ← origin IDs
domains: train, hotel
goal: hotel: { book: { day: thursday, people: 7, stay: 3 }
info: { name: aylesbray lodge guest house } ... ← dialogue goal descriptions
train: { book: { people: 7 }, info: { arriveBy ... }
message: *You are looking for information in Cambridge. You are looking for a train. The train should arrive by ...*
utterances: [
{ ... actor: user ... *I am looking for a train arriving by 21:45 and departing from cambridge.* ... **turn**: 1, **intent**: train },
{ ... actor: system ... *What day are you making this trip, and where would you like to travel to?* ... **turn**: 1, **intent**: train }, delexicalized versions
{ **actor**: user,
utterance: *Hi I would like to go to kings lynn on sunday please.*
delex_utterance: *Hi I would like to go to [destination] on [day] please.*
nlu: Train-Inform(day=Sunday, destination=kings lynn) ← consistent NLU & state format
state: train-day: Sunday, train-departure: cambridge,
train-destination: kings_lynn, train-end_time: 21:45 ← unified domain, intent, slot names
turn: 2, **intent**: train },
{ **actor**: system,
utterance: *Train TR1600 leaves Cambridge at 20:11 and arrives in Kings Lynn at 20:58. Would that work?*
delex_utterance: *Train [train id] leaves [departure] at [leave at] and arrives in [destination] at [arrive by]. Would that work?*
nlu: Train-Inform(arriveby=20:58, departure: Cambridge ...)
&general-reqmore(),
turn: 2, ...} ...]

intent, domain, slot, speaker, value, turn

Baseline results





- Train: 4 subcorpora mixes
- Eval.: SGD MW DIASER

MarCo
GPT

Presented at LREC 2022, Marseille.

https://github.com/ufal/diaser

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