University of Stuttgart
Institute for Natural Language Processing

CollegeBot: A Chatbot to find the right university

Helping prospective U.S. bachelor's students

A Spoken Dialogue Systems Project

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Motivation and Domain

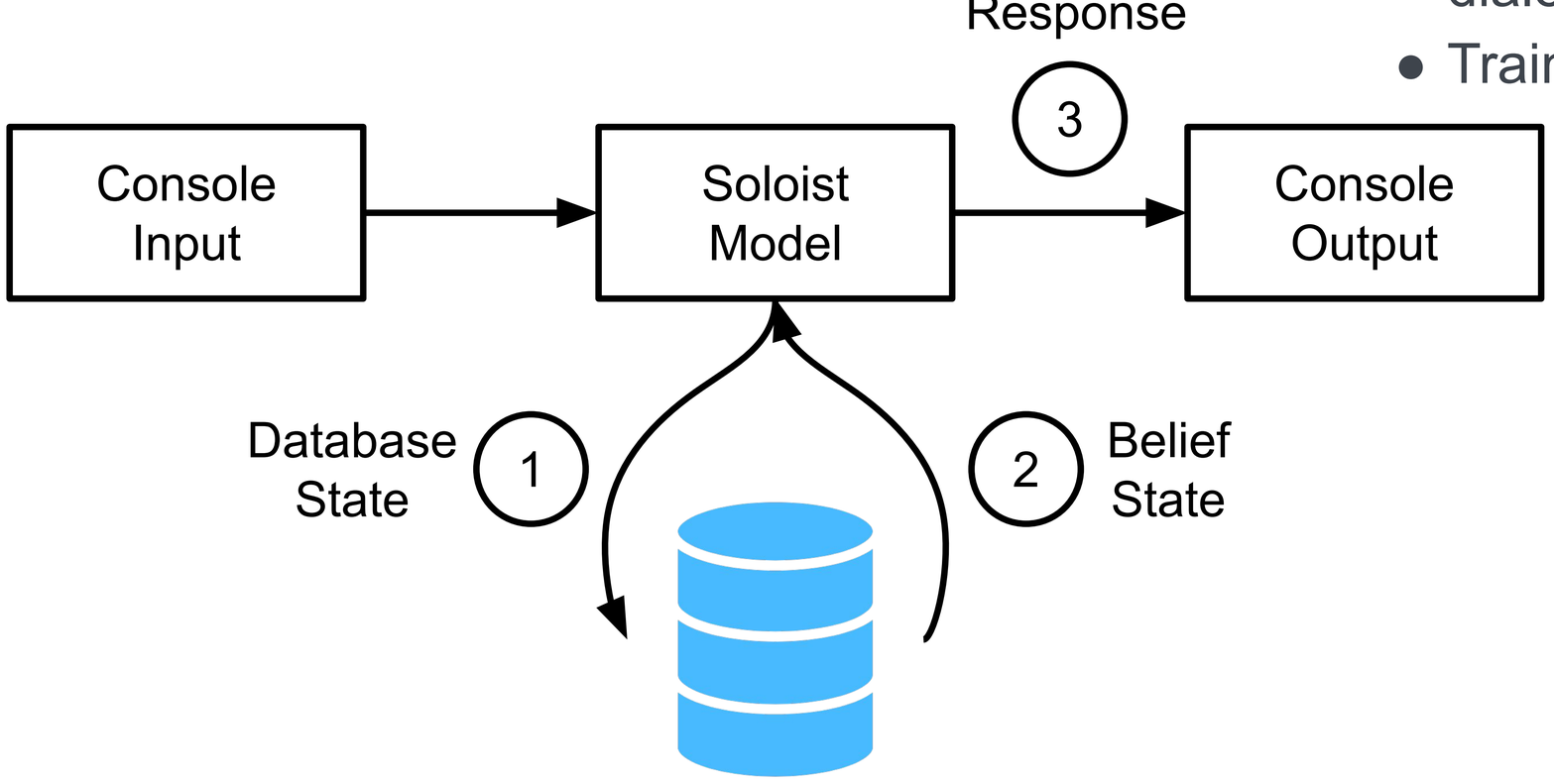
- Goal: Guide university choice
- Domain: Bachelor degrees in the U.S.
- Data Source: College Scorecard[1]
- Our pruned and processed Dataset: 50 US universities in 22 states, 18 study areas
- Slots: Name, Alias, Location, Website, Number of Students, Admission Rate, Cost, Earnings, Debt, Completion Rate, Study Areas

Implementation

- End-to-end approach: Soloist[2], a pre-trained dialog system
- Fine-tuning using 100 handcrafted training dialogues + 180 automatically generated ones
- Integration into Adviser[3]

Experimental Design

- Analysis: Training data size, edge cases, limit probing, multi-turn



Results

Test Case	Adequacy[4]	Fluency[4]	Belief State Accuracy
Base	3.15	4.4	0.37
Base (less data)	4.7	4.9	0.23
Two-turn	4.6	4.6	
Negation	4.65	4.95	
Unknown Data	2.5	4.85	
Typos	2.85	5	
Paraphrasing	3.5	5	

Limitations

- Errors
  1. False positives in BS: Some values are predicted over and over again
  2. False negatives in BS: Model worse at some slots/values than others
- LM length limit

Conclusions

- Fluency good, BS prediction needs work
- Quality and quantity of training dialogues important
- Training Soloist is non-trivial

Future Work

- Improve BS prediction
- Expand dataset

[1] Department of Education 2023 U.S. government, last accessed 31 July 2023.
[2] Peng, Baolin et al. (2021). *SOLOIST: Building Task Bots at Scale with Transfer Learning and Machine Teaching.* In TACL, 9:807-824.
[3] Ortega, Daniel et al. (2019). *ADVISER: A Dialog System Framework for Education & Research*. In ACL, 93-98.
[4] human annotation, 5-point Likert scale, average of 3 annotators

U.S. DEPARTMENT OF EDUCATION
College Scorecard