


# Why is conversation is hard?

World Knowledge

Domain knowledge

Discourse knowledge


What flights to SFO are there tomorrow afternoon?



I found three flights from WAS to SFO tomorrow afternoon:

- \$199 DCA-SFO 2:15-3:44pm
- \$377 BMI-SFO 4:45-5:15pm
- \$232 IAD-SFO 6:00-6:30pm

Ok book the last expensive one for two adults and 1 infnt




Ok, you want to book:

- \$232 IAD-SFO 6:00-6:30pm

Right?

No, the DCA flight




Unfortunately there are not enough seats available on flights:

- \$199 DCA-SFO 2:15-3:44pm
- \$232 IAD-SFO 6:00-6:30pm

Would you like to book this flight?

- \$377 BMI-SFO 4:45-5:15pm

🙄 ok sure



Ok, first I'll need the name and ID of the first adult passenger.

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# Successes and shortcomings of current NLP systems

## Successes

- Web search is now conversational, relevance has improved, remarkable long tail coverage.
- Machine translation is (essentially) a solved problem
- STT word error rates are low enough to make voice systems broadly useful in the real world
- TTS systems are able to generate realistic sounding voices
- Text generation systems (GPT family of models), within certain confined settings, pass writer's Turing test.
- Voice/chat bots have fundamentally changed HCI

## Shortcomings

- AI assistants fall far short of human level interaction. At the highest level, this might/probably suggest(s) that learning textual representations alone is not sufficient to achieve this goal. In some ways this seems obvious. The problems of reference resolution and broad domain knowledge seem to be primary culprits, though this is a small slice of the problems that exist. **NLP is an exciting field to be in!**
- AIs built on logical representations of text are naturally equipped to perform logic & arithmetic, e2e AIs built on DNNs are not.
- Learning from voice/text, not surprisingly, means learning biases in those data; building systems around those biases propagates those biases. Technology should be for the benefit of society, thus fair and inclusive; thus making systems fair and inclusive is an important area of R&D.