

Two Schools of Language Understanding

Knowledge (Rule) Based

“It must be recognized that the notion of "probability of a sentence" is an entirely useless one, under any known interpretation of this term.” Noam Chomsky

“Do not guess if you know” Ron Kaplan

Data Driven

“Airplanes don't flap their wings” Fred Jelinek

“Every time I fire a linguist, my performance goes up.” Fred Jelinek

Language Understanding for Conversational AI

- Focusing on task/domain-specific (usually flat) semantic template filling, i.e., “task/domain” defines the semantic representation
- Not generic understanding, instead “targeted” understanding
- Mostly on conversational understanding systems for parsing user input (e.g., Siri, Cortana, Alexa)

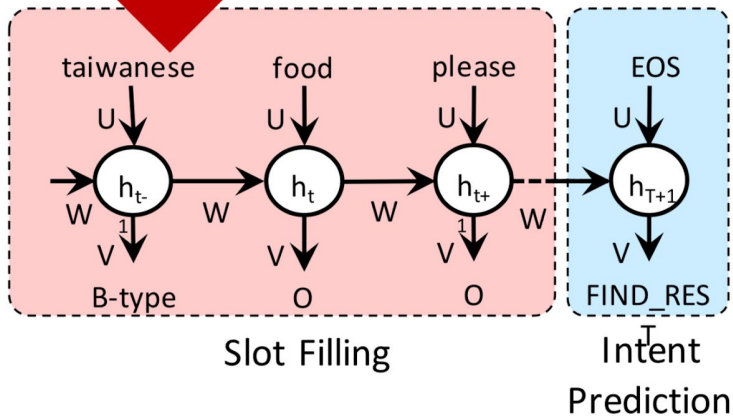
Please show me the flights to Boston on Monday.

Domain: Flights
Intent: Find Flights
Destination: Boston
Date: Monday

Language Understanding Modeling

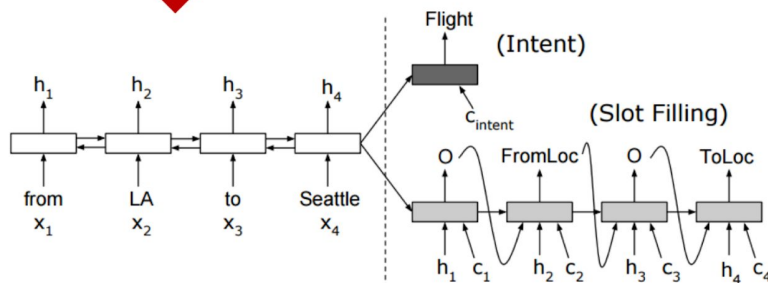
Sequence-based
(Hakkani-Tur et al., 2016)

- Slot filling and intent prediction in the same output sequence



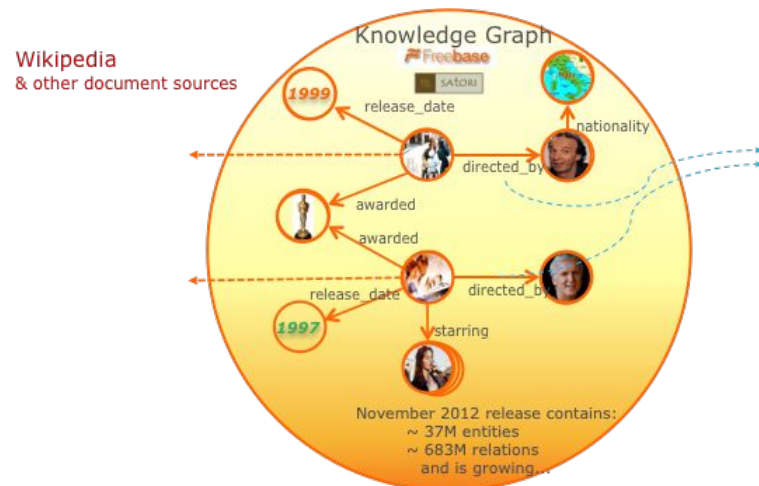
Parallel
(Liu and Lane, 2016)

- Intent prediction and slot filling are performed in two branches



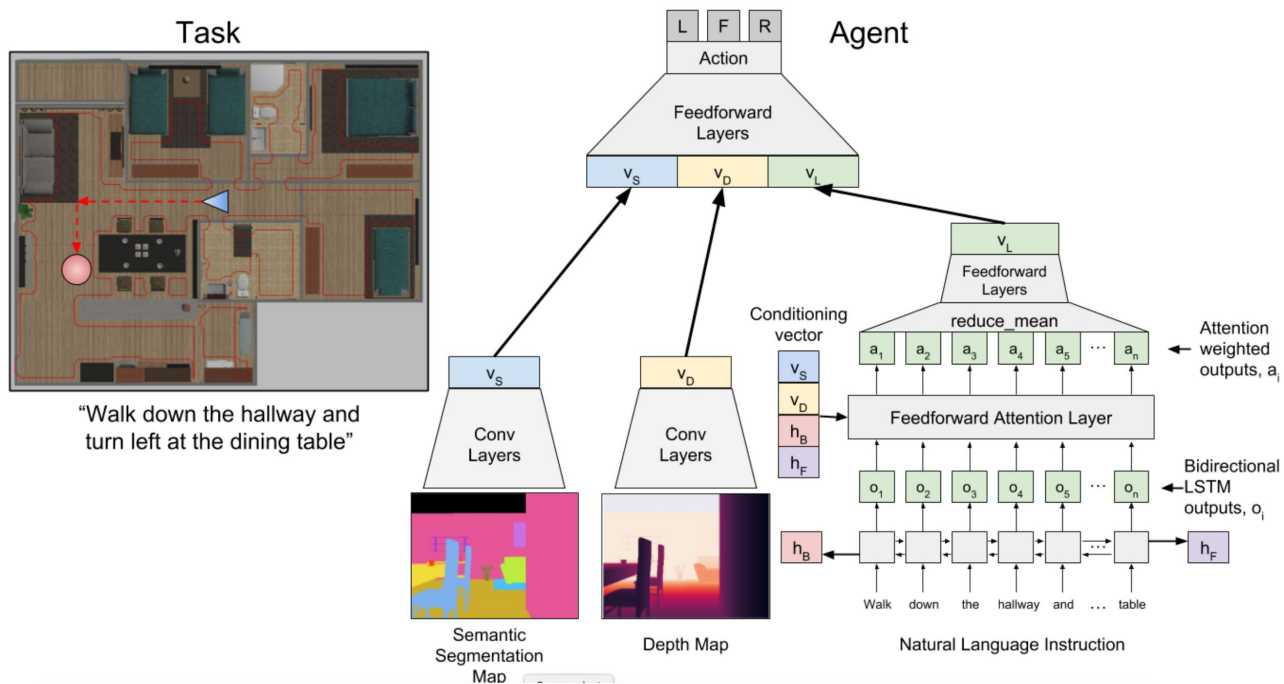
What is the Problem with Data Driven?

- Model has no idea what a “ticket” or “restaurant” is.
- Attempts for compiling world knowledge in a knowledge graph
- Concept “embeddings” are the meanings...
- Is there a better way?



What is the Solution?

- Humans do not learn language like machines.
- Need to move to RL based multimodal grounded language understanding



Thank You!

