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Motivation

I don't like thrillers; I love action movies and comedies.

Traditional dialog state

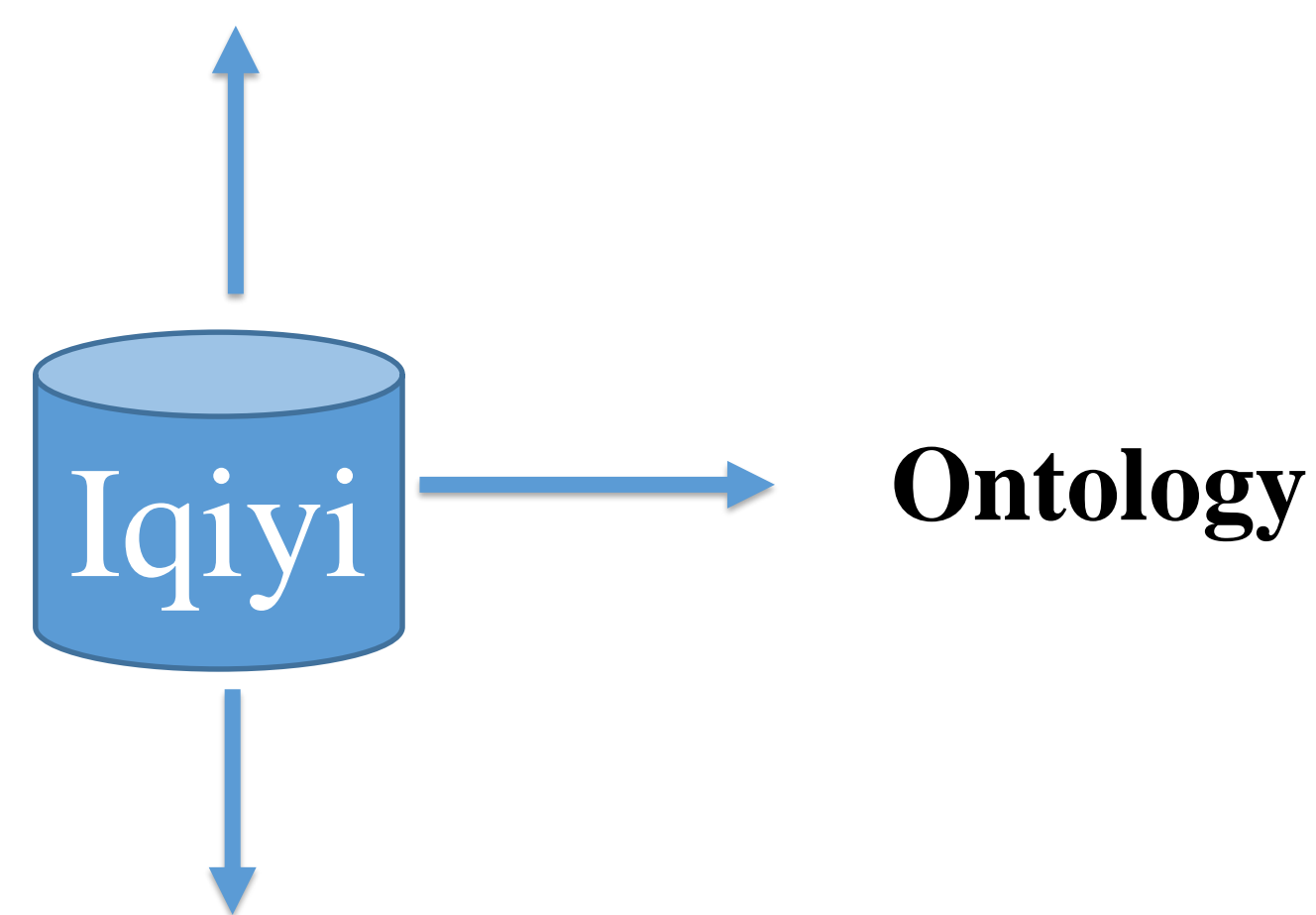
Inform(Genre=comedy)

Enriched dialog state

Inform(Genre=MENTIONED,
Thriller=DISLIKE,
Action=LIKE,
Comedy=LIKE)

Iqiyi movie dialog dataset

Value labels η_v : LIKE, DISLIKE, NOT_MENTIONED
Slot labels ξ_s : DON'T_CARE, MENTIONED, NOT_MENTIONED
Enriched Dialog States



# movies	147
# dialogs	800
# Informable slots	7
# Requestable slots	11
# values	599
# synonyms	200
# words	1527

Dialog Tasks

Searching task: *I want frightening films directed by Cameron.*
Enquiring task: *How's the rating of Aliens?*
Mixing task: *How's the rating of Cameron's thrillers?*

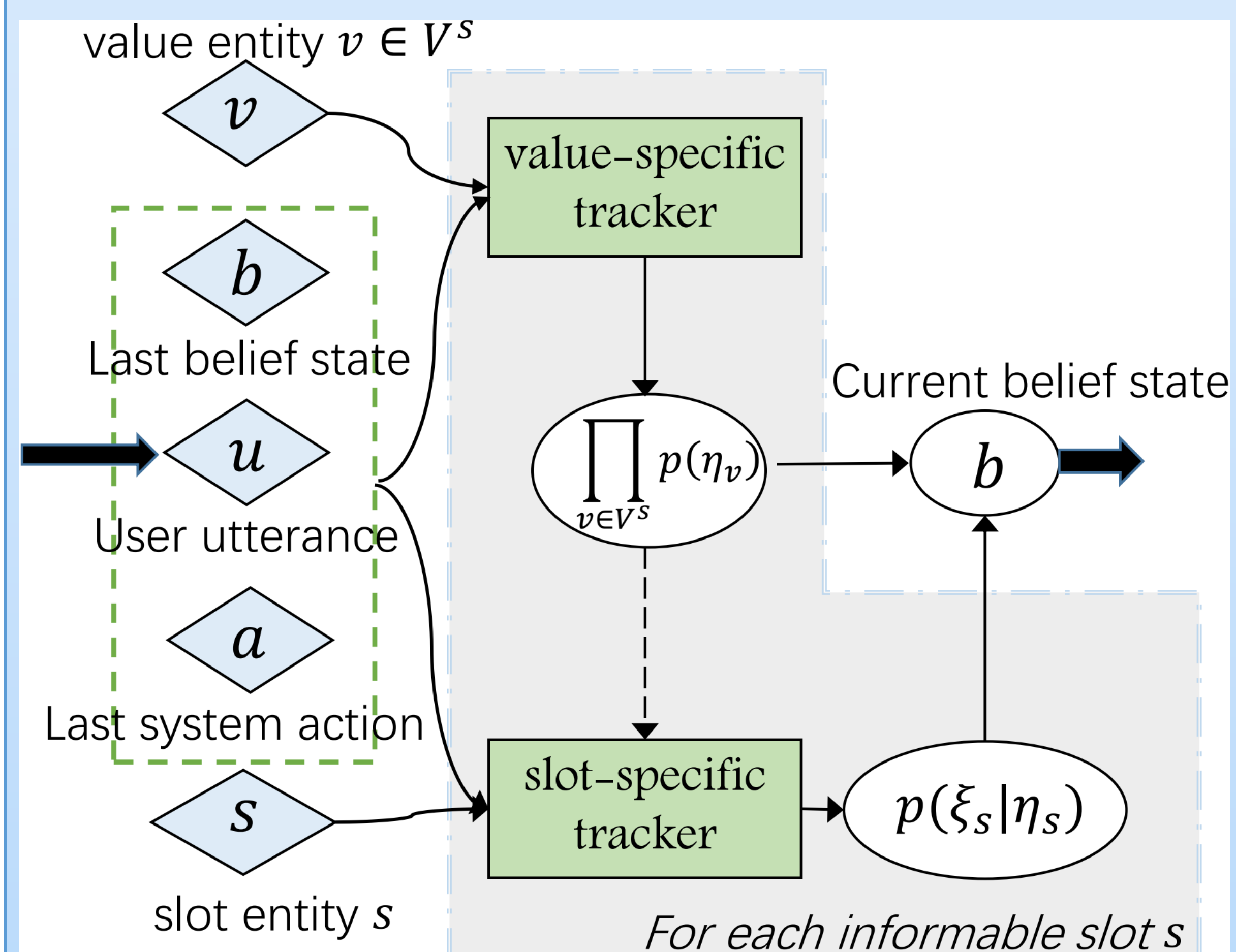
Enriched Dialog State Tracker

Assumption:

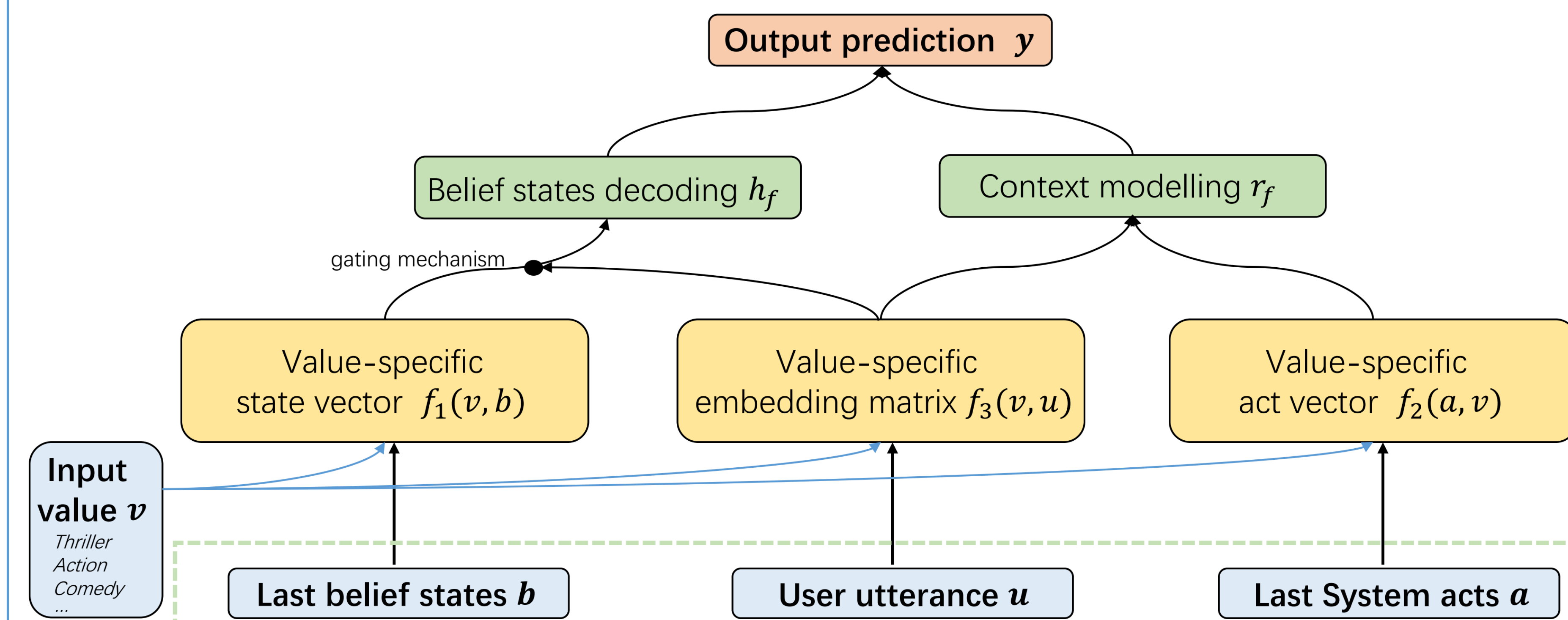
- ◆ The dialog is Markovian.
- ◆ Informable slots are independent.
- ◆ Values of each informable slot are also independent.

$$p(\xi, \eta) = \prod_{s \in S} p(\xi_s, \eta_s) = \prod_{s \in S} p(\xi_s | \eta_s) p(\eta_s)$$

$$= \prod_{s \in S} \left(p(\xi_s | \eta_s) \prod_{v \in V^s} p(\eta_v) \right)$$



Value-specific tracker



Evaluation

Data set / Model	WOZ 2.0		DSTC2		Iqiyi	
	Joint Goal	Request	Joint Goal	Request	Joint Goal	Request
EDST +dict.	87.5	95.3	--	--	70.1	97.4
EDST	85.2	95.2	73.9	96.6	63.6	97.0
EDST -spec.	63.0	90.5	--	--	--	--
NBT	84.4	91.6	73.4	96.5	--	--
MemN2N	--	--	74	--	--	--
RNN+dict.	83.7	87.6	72.9	95.7	--	--
RNN	70.8	87.1	69.1	95.7	--	--
Template	--	--	--	--	46.3	82.5