Multi-domain Dialogue State Tracking
Using Recurrent Neural Networks

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Dialogue State Tracking
User goals are represented as sets of constraints expressed by slot-value pairs

Good morning, how can I help?
Hi. I’m looking for a Chinese restaurant.
What area would you like?
How about something near Regent Street.
Szechuan is the only restaurant which serves Chinese food near Regent Street.
What’s the address please?
Szechuan can be found at 15 - 21 Ganton Street.
Awesome, thanks for your help, bye!
Thank you, goodbye!

Towards Open-domain systems
Can a single model track dialogue state across disjoint dialogue domains?

Delexicalised features
Capture dialogue dynamics and facilitate generalisation to unseen slots and domains

I want Chinese food
I want cheap price range
I want VALUE SLOT

Sharing information via delexicalised features facilitates transfer learning
The trained model can be applied to new domains, with the learnt feature handling unseen n-grams such as [want available internet]
The more diverse the available dialogue domains are, the more general the extracted delexicalised features and the trained model become!

The General Model
We train a single belief tracking model which learns from delexicalised training data drawn from all slots across all the domains available

Accuracy Across Domains

Initialising Belief Tracking Models for New Domains
The use of shared models trained using out-of-domain dialogues leads to superior belief tracking performance