



Joint Models for Goal-driven Dialogue

Xiaojie Wang

Center for Intelligence Science and Technology
Beijing University of Posts and Telecommunications



- Single model
 - Transfer to single task
- Joint models
 - Parallel
 - Hierarchical
 - Multi-turn information



■ One Labeler for Two Subtasks

- Treat Intent as a label, one labeler for both Intent Identification and Slot Filling

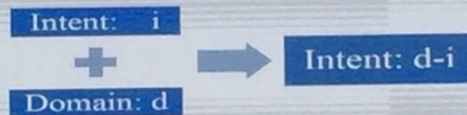
input	I	like	a	Chinese	food	.	Intent label
label	O	O	O	B	I	O	Order

- Models for sequence labeling: CRF, LSTM+CRF etc.
- Problems:
 - Hierarchical relation instead of flat one between two subtasks
 - Relation between different dialogue turns

Jeong M, Lee G G. Jointly modeling intent and named entity for spoken language understanding[C]// Spoken Language Technology Workshop. 2006:66-69.

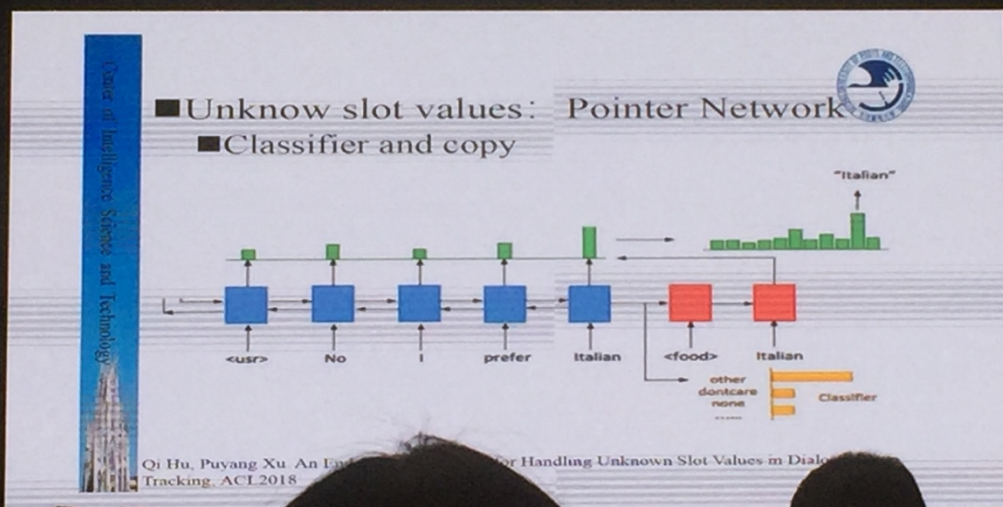
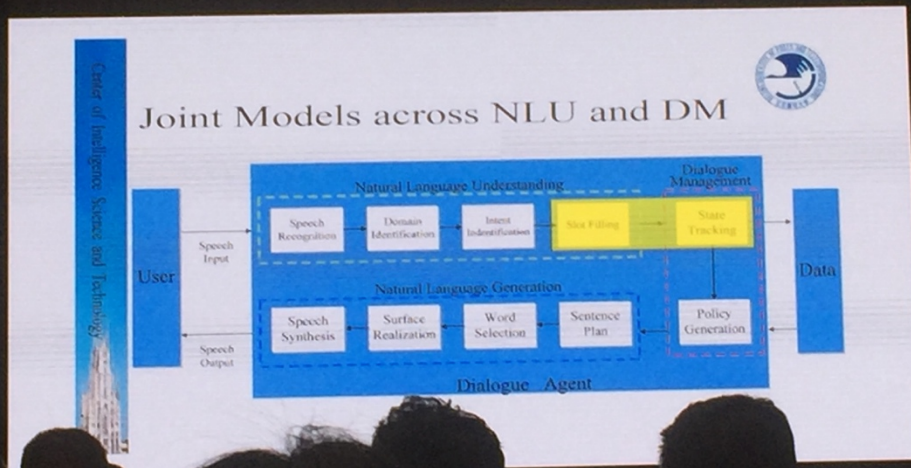


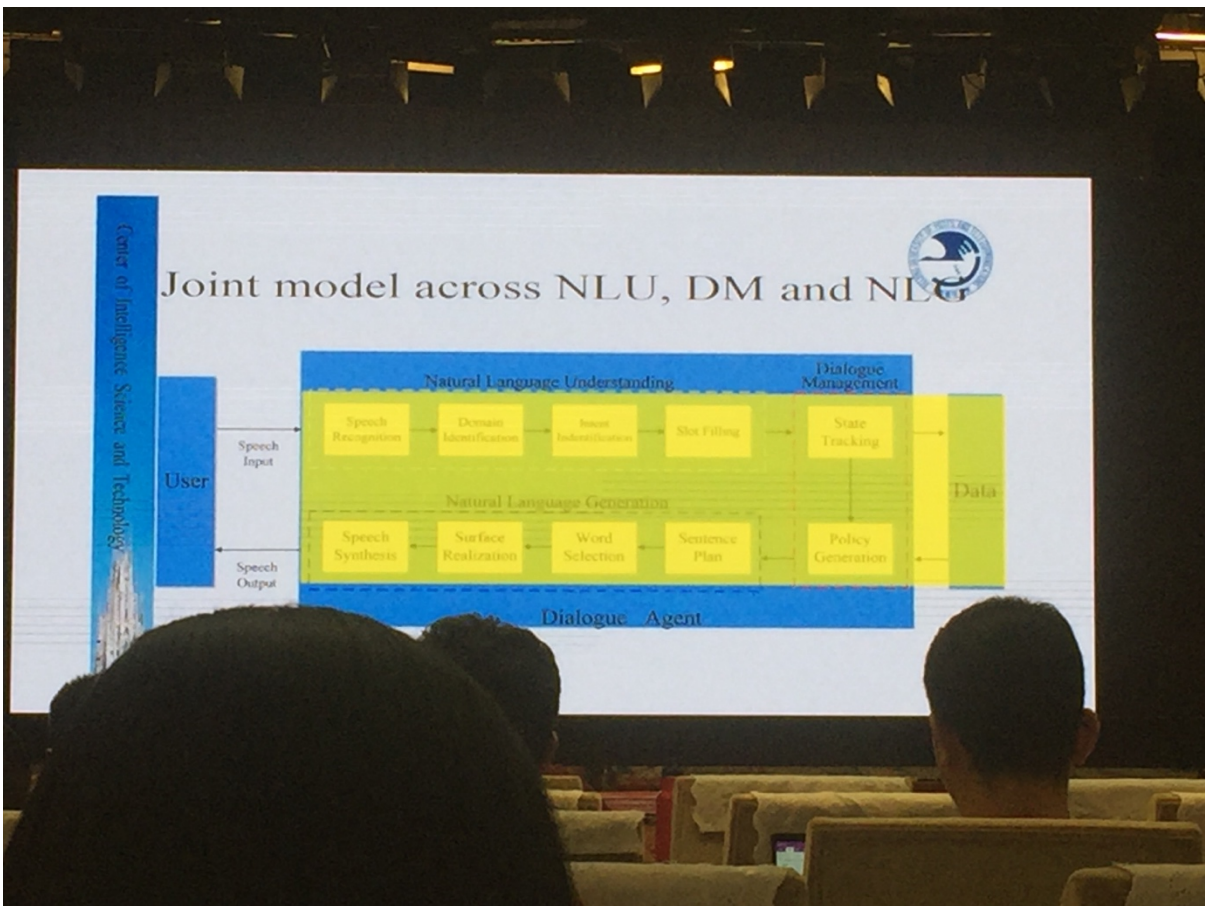
- Redefine intent: merge domain into intent



- Joint models for intent identification and slot filling can be used for jointly modeling three subtasks.

Guo D, et al. Joint semantic utterance segmentation and slot filling with recursive neural networks. In: Proceedings of the 2013 Conference on Empirical Methods in Natural Language Processing. 2013:55-64.





Center of Intelligence Science and Technology

Pipeline, Joint and End-to-End

	Model	Training	Implementation
Pipeline	Separately	independently	Sequently
Joint	Simultaneously (separately & As a whole)	Jointly	Concurrently & Sequently
End-to-End	Separately & Simultaneously	Independently & Jointly	Sequently & Concurrently