

Spoken Language Understanding for New-Generation Dialog System

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Paradigm Shift in Dialog System

- Task
 - form filling → search and QA
- Approach
 - rule-based SLU → statistical SLU or hybrid

From RDB query To text search or QA

Backend

ASR

SLU

Dialog

Relational
Database (RDB)
(flight, bus..)

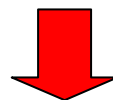
Finite
State
Grammar

Mapping
to **SQL**

State-based
(voice XML)



Text base (KB)
(Wikipedia,
Web...)



SLM
(N-gram)

Statistical
Matching
(**vector
space**)

Dynamic
clarification
& disambiguation

Kyoto Navi. using Wikipedia as backend KB (see Demo.1)

Search query

U1: "Tell me the Golden Pavilion."

System-initiative question

S1: "The Golden Pavilion is one of the buildings in the Rokuon-ji in Kyoto, and is the main attraction of the temple grounds. The entire pavilion except the basement floor is covered with pure gold leaf."



*System scripts are taken from English version of Wikipedia

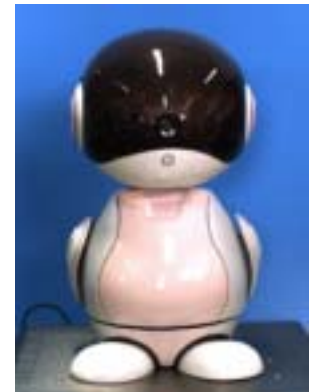
Kyoto Navi. using Wikipedia as backend KB (see Demo.1)

Question about date

U2: "When was it built?"

System-initiative question

S2: "The Golden pavilion was originally built in 1397 to serve as a retirement villa for Shogun Ashikaga Yoshimitsu."



*System scripts are taken from English version of Wikipedia

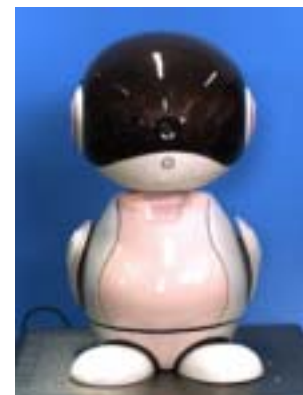
Kyoto Navi. using Wikipedia as backend KB (see Demo.1)

Search query

U3: "No, please tell me."

System-initiative question

S3: "Well then, do you know what was awarded to this temple in 1994?"



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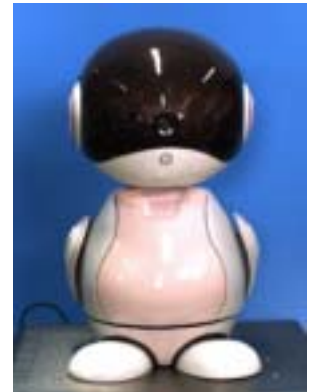
Kyoto Navi. using Wikipedia as backend KB (see Demo.1)

Question about access

U4: "How can I get there?"

System-initiative question

S4: "It was awarded as listing on the UNESCO World Heritage site in 1994."



*System scripts are taken from English version of Wikipedia

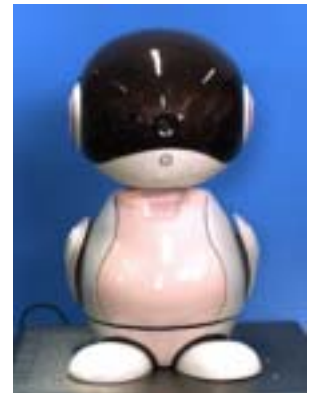
Kyoto Navi. using Wikipedia as backend KB (see Demo.1)

Question about access

U4: "How can I get there?"

System-initiative question

S5: "It is 1 minutes walk from the Kinkauji-mae bus stop."



*System scripts are taken from English version of Wikipedia



Overview

- Giuseppe Riccardi: problem solving dialog
- Gary Geunbae Lee: dialog for QA
- Michiel Bacchiani: GOOG411 directory assistance
- Ye-Yi Wang: voice search -- directory assistance

Question

- What are the major challenges?
- What are the real problems now?
 - still robustness?
 - data sparseness?
- How can we train with sparse data?
- Or can we just have to keep collecting a large amount of data?
- Are NLP technologies directly applicable to speech?