

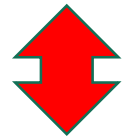
# Human-like Dialogue with Robot

Tatsuya Kawahara  
(Kyoto University, Japan)

# Viewpoint of Spoken Dialogue

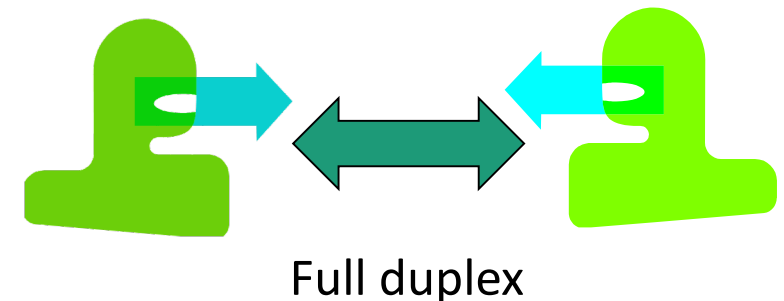
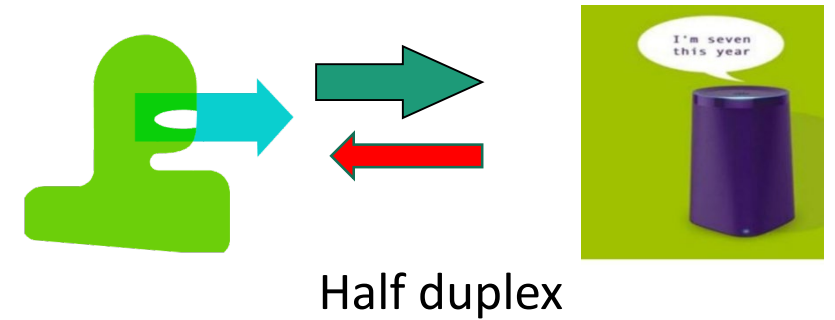
- **Human-Machine Interface**

- Command & Control
- Database/Information Retrieval
- One command/query → One response
- No user utterance → No response



- **Human-Human Dialogue**

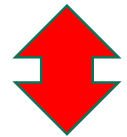
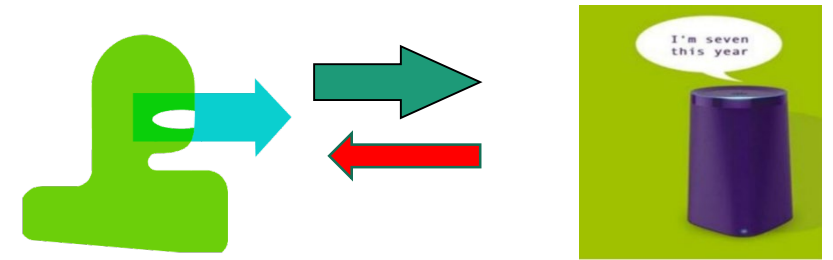
- Task goals are not definite
- Many sentences per one turn
- Backchannels



# Spoken Dialogue and Task

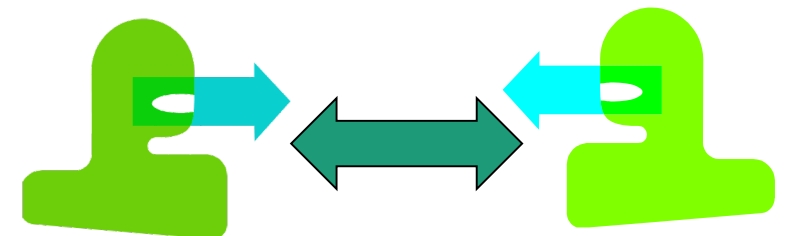
- Dialogue as a means to complete a task by machine

- Task goals are objectively defined & shared
- Must be done ASAP



- Dialogue itself can be a task for human

- Task goals are not definite
- But NOT chatting (to kill time, socialize)



# Android **ERICA**



[English demonstration video](#)

# Android **ERICA** Project

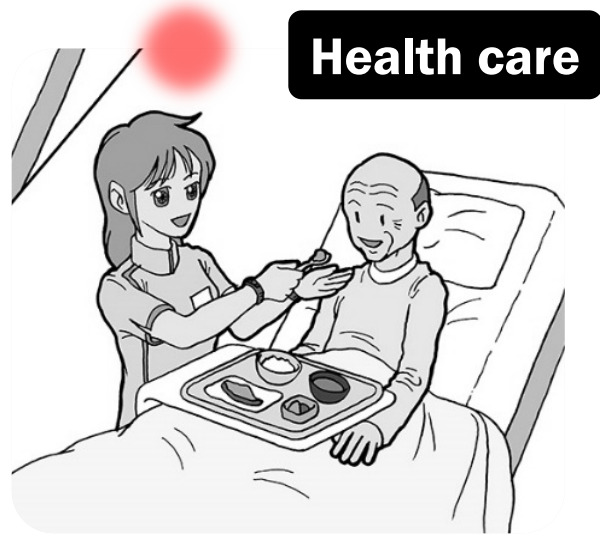
- Goal: Autonomous android who behaves and interacts just like a human
  - Facial look and expression
  - Gaze and gesture
  - Natural spoken dialogue
- Criterion: **Total Turing Test**
  - Convince people it is comparable to human, or indistinguishable from remote-operated android
- Science:
  - Reveal what is missing or critical in natural interaction
- Engineering Applications:
  - Replace social roles done by human
  - Conversation skill training



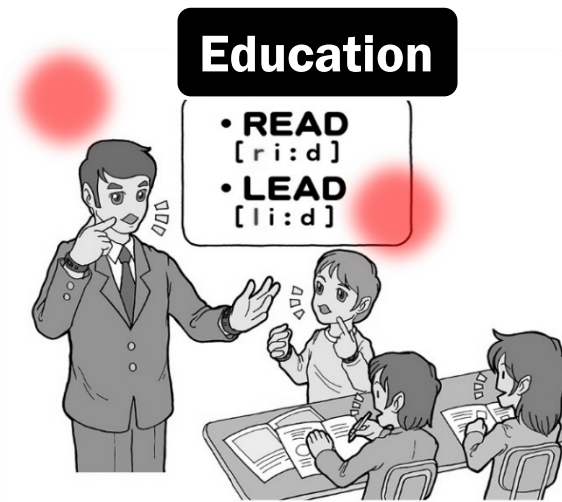
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that with



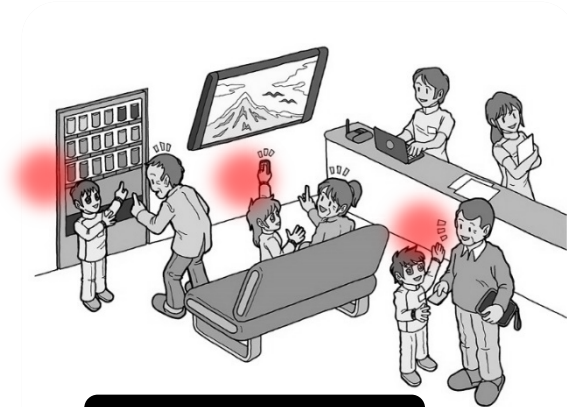
# Symbiotic Society with Robots



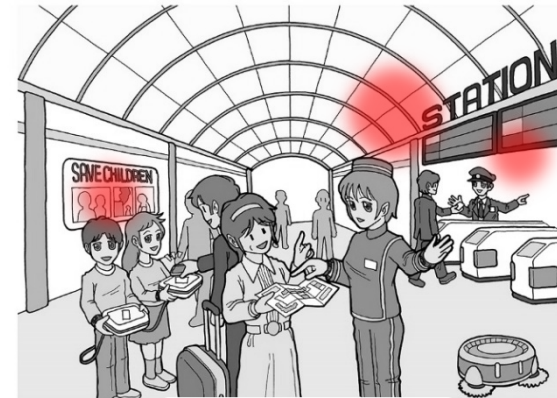
**Health care**



**Education**

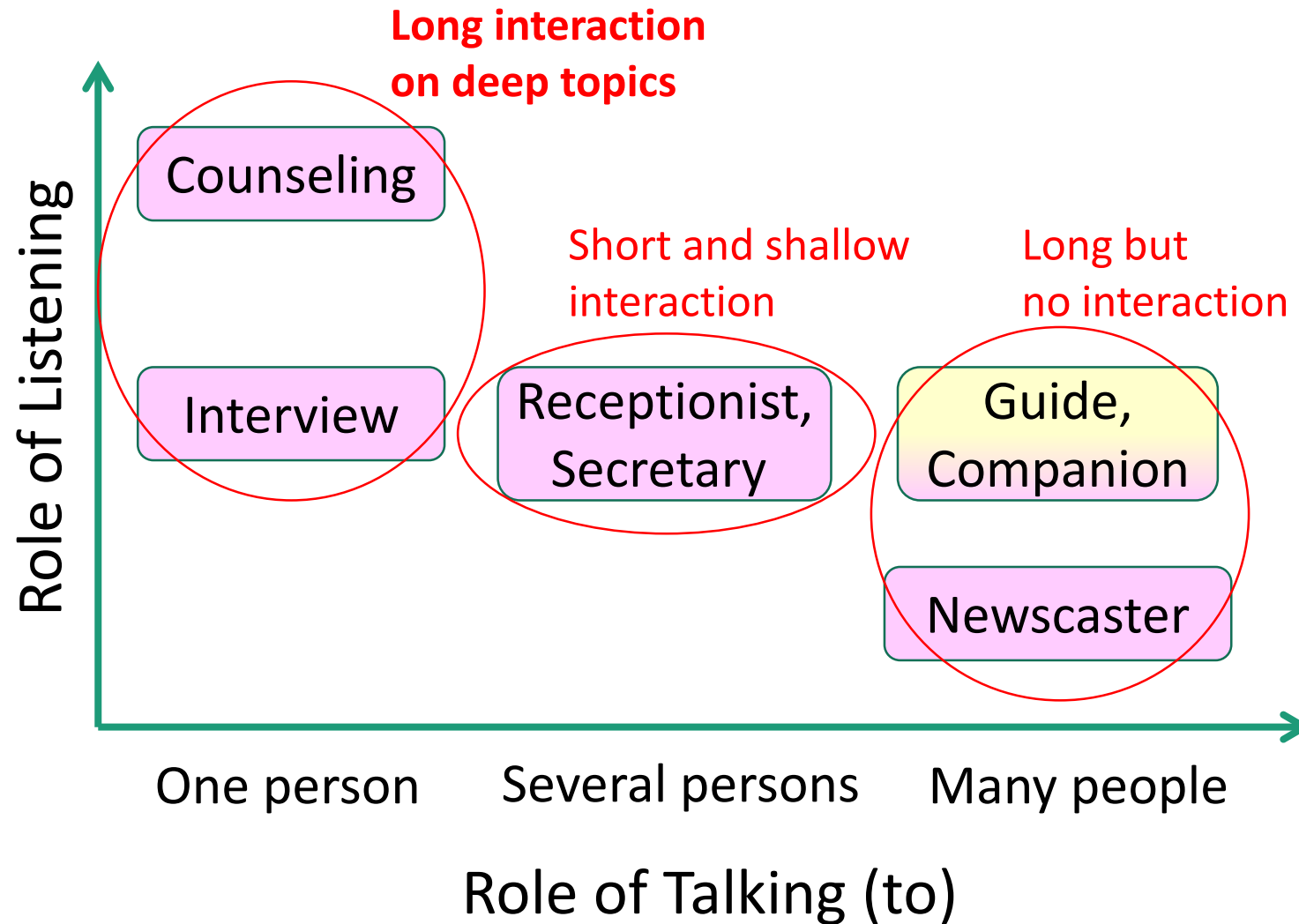


**Receptionist**



**Attendants**

# Social Roles of ERICA



# Task 1: **Attentive Listening**

- ERICA mostly listens to senior people
  - Topics on memorable travels and recent activities
  - Encourages users to speak smoothly
- Natural backchannels
  - Timing, lexical tokens and prosody
- Partial repeats
- Elaborating questions
  - based on focus words

**Demo @ ASRU-2017**





## Task 2: **Job Interview** (Training)

- ERICA plays a role of interviewer
  - asks questions, which are answered by users
  - makes additional questions according to initial answers
  - provides a realistic simulation, or replace human
- Users need to appeal themselves



Physical presence  
and face-to-face  
is important!

# Task 3: **Speed Dating** (Training)

- ERICA plays a role of female participant
  - asks questions to users AND answers questions by users on topics such as hobbies, favorite foods and music
  - provides a realistic simulation by not being too friendly
  - gives proper feedbacks according to the dialogue
- Users need to not only appeal but also listen



Physical presence  
and face-to-face  
is important!

# Ethical Problems

- Can robot be a counselor?
- Can robot assess a human?
  - Can AI assess a human?
  - How to guarantee the decision without bias/discrimination
- Can robot be a soul mate of a senior person?
  - Can AI agent be a soul mate (lover) of a young person?

For Demo Video

Search [“2018 ERICA @ kyoto-u”](#)