

Generating Fictive Dialogue from Monologue

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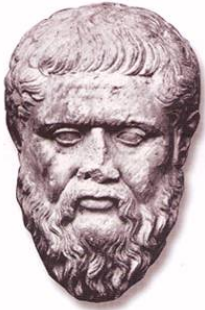
Mitsuru Ishizuka



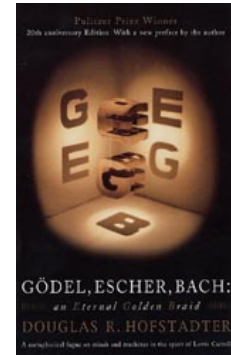
THE UNIVERSITY OF TOKYO

What is fictive dialogue?

- Historical precedent: Plato, Erasmus, Galileo, ..., Hofstadter



...



- Common on Radio, TV, Theatre, Games, ...



Why Fictive Dialogue?

A means for presenting information which complements monologue diagrams and pictures.

- successful for entertainment
- allows an author to introduce different points of view
- can be effective in education and persuasion

Why Fictive Dialogue?

- Students write more in free recall test (Craig et al., 2000)
- Students ask more and “deeper” questions in a transfer task (Craig et al., 2000)
- There is more discussion amongst students and less irrelevant banter (Lee et al., 1999)
- Student learning is at least as good as in monologue condition (Cox et al., 1999)
- Team of two agents having a conversation more persuasive than a single agent directly addressing a user (Suzuki & Yamada, 2004)

Generating Fictive Dialogue



Automated Generation of Fictive Dialogue



Generating Fictive Dialogue

- Approaches:
 - From data to script (Piwek & Van Deemter, 2007 [RLaC](#); Van Deemter et al., 2008 [AIJ](#))



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CONVERSATIONAL AGENTS



Database (Java JAM)

```
FACT attribute "car-1" "horsepower" "80hp";  
FACT impact "car-1" "horsepower"  
    "sportiness" "pos";  
FACT importance "horsepower" "sportiness"  
    "high";  
FACT role "Ritchie" "seller";  
FACT role "Tina" "buyer";  
FACT trait "Ritchie" "politeness"  
    "impolite";  
...
```


Generating Fictive Dialogue

- Approaches:
 - From data to script (Piwek & Van Deemter, 2007 [RLaC](#); Van Deemter et al., 2008 [AIJ](#))



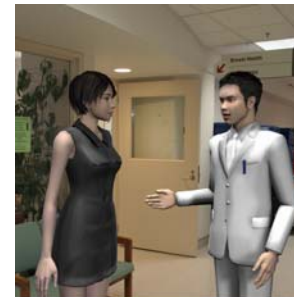
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- From text to script (T2D) Piwek et al. 2007 [IVA07](#)

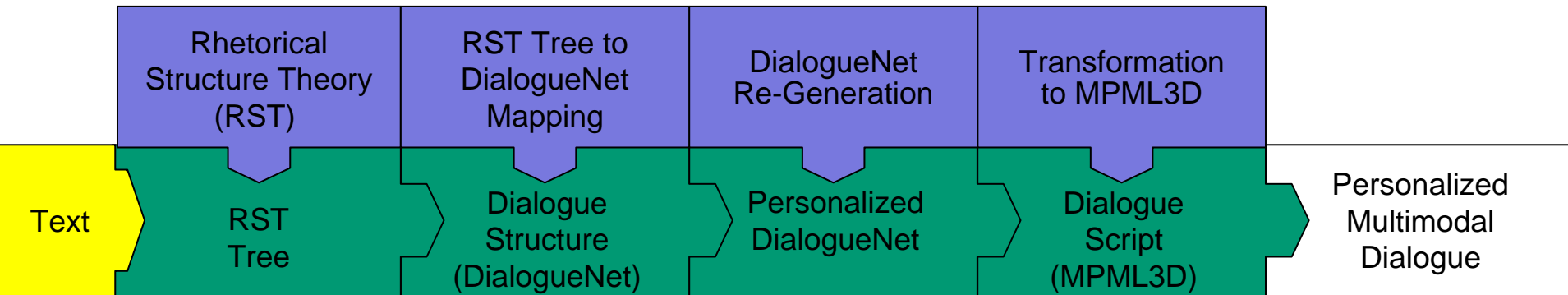
*Patient
information
leaflets*



The T2D System

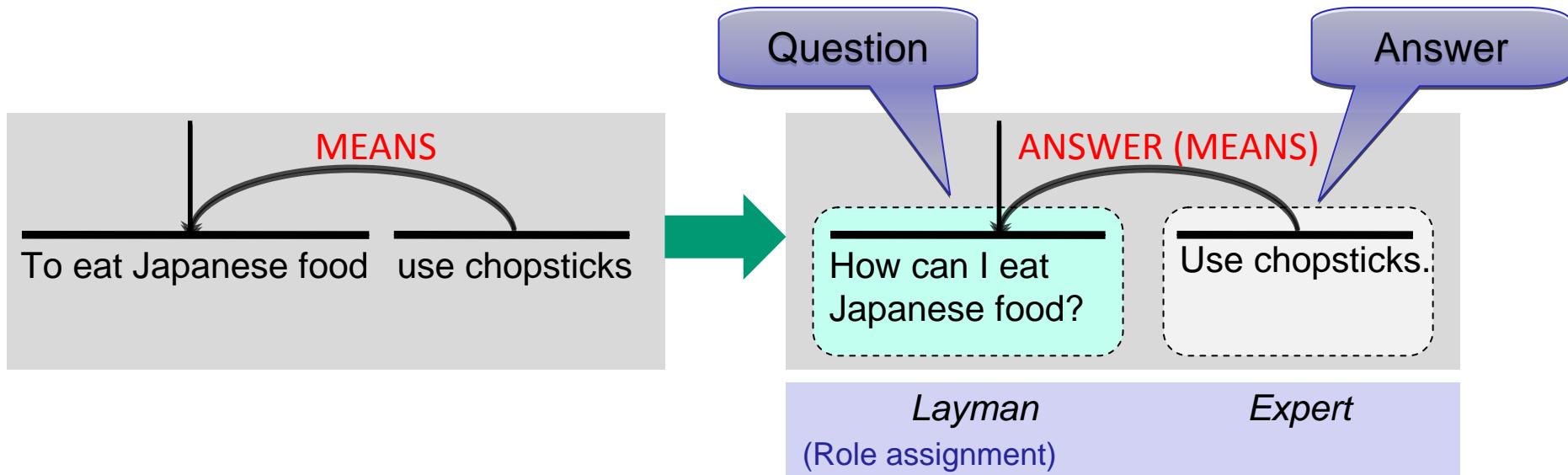
- **Input:** monologue (text)
- **Output:** dialogue (text/presentation)
- **Information/meaning** conveyed by text is preserved.
- **Coherence relations** in the text are preserved.

T2D: System Architecture



Slide design inspired by J. Cassell on BEAT

RST Tree to DialogueNet

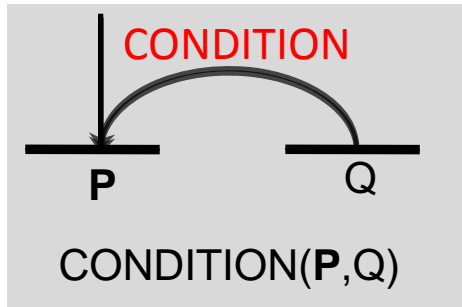


T2D: Input

Patient Information Leaflet (from PIL corpus)

[...] Do not take Klaricid tablets if you are allergic to clarithromycin. Klaricid does not interact with oral contraceptives. [...]

RST Tree to DialogueNet



1) Nucleus in Imperative Form

(“Take Klaricid tablets” / “Do not take Klaricid tablets”)

CONDITION(P,Q) & imperative(P) \Rightarrow

Layman: Under what circumstances should I **P***?

Expert: If Q.

2) Nucleus in Declarative Form with Modal Auxiliary

(“You should take Klaricid tablets”)

CONDITION(P,Q) & declarative-modal-aux(P) \Rightarrow

Layman: Under what circumstances *flip*(**P***)?

Expert: If Q.

3) Alternative Mapping

CONDITION(P,Q) \Rightarrow

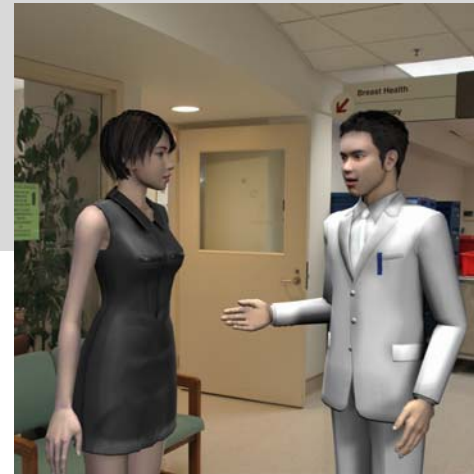
Layman: What if Q*.

Expert: Then **P**.

P* is P[l:=you,you:=l,my:=your,your:=my,mine:=yours,yours:=mine];
flip(X) inverses subject and auxiliary.

MPML3D

```
<MPML3D version="1.0">
<Head>...</Head>
<Body startImmediately="Demo1">
- <Task name="Demo1" priority="0">
- <Sequential>
- <Parallel>
  <Action name="yuukiSpeak">yuuki.speak("Under what circumstances shouldn't I take Klaricid tablets? ")</Action>
  <Action minor="true" startOn="yuukiSpeak[1].begin" stopOn="yuukiSpeak[9].end">yuuki.turnHead(-10,0.2,10,0.3)</Action>
  <Action minor="true" startOn="yuukiSpeak[1].end" stopOn="yuukiSpeak[9].end">ken.turnHead(10,0.2,10,0.2)</Action>
</Parallel>
<Action>ken.turnHead(10,0.2,0.3,0.2)</Action>
- <Parallel>
  <Action name="kenSpeak">ken.speak(" If you are allergic to clarithromycin. ")</Action>
  <Action minor="true" startOn="kenSpeak[1].end" stopOn="kenSpeak[6].end">ken.turnHead(10,0.2,10,0.2)</Action>
  <Action minor="true" startOn="kenSpeak[2].begin">ken.gesture("BEAT_SINGLE", 0.2, 0.6)</Action>
  <Action minor="true" startOn="kenSpeak[2].begin">yuuki.gesture("breath")</Action>
</Parallel> ...
</Sequential>
</Task>
</Body>
</MPML3D>
```



Preliminary Evaluation

- Ongoing work: 9 relations implemented so far.
- DAS evaluation
 - Random sample of 100 conditionals;
 - correct 61%, failure 39%;
 - Details failure: 19% OCR error; 19% No mapping; 22% DAS crashes; 40% incorrect analysis (15.6% overall).
- Mapping evaluation
 - Fresh random sample of 100 conditionals;
 - Manually annotated in terms of RST;
 - Mapping 92% correct; 8% incorrect (4% machineese syntax error; 4% mapping rules did not cover a specific case).

Current and Future work

- Mapping nested rhetorical relations (Hernault et al., 2008 [IVA08](#))
- Robustness/domain-independence (RST Discourse Treebank, ...)
- Empirical foundations: building a parallel monologue-dialogue corpus
- Question Generation Shared Task and Evaluation (www.questiongeneration.org)

