TUTORIAL DIALOGUE

Kepa J. Rodriguez
kepa@coli.uni-sb.de

1. What is tutorial dialogue?

2. General features

   (a) About collaboration

   (b) Dialogue moves

3. General proposal for the architecture

What is tutorial dialogue?

A tutorial dialogue has two DP's with hard defined roles: Tutor & Student.

The tutor guides the student in the learning process, rather than giving all the information.

Intelligent Tutor System (ITS)

An ITS must support:
a) Unconstrained NL input.
b) “Extending” tutoring strategies.

A computer tutor must deal with:
1) Failure:
- If the tutor didn’t understand a response of the student.
- If the student gives a unexpected answer.
- If the teaching tactic doesn’t work.
2) Interruptions.
3) The need to revise the teatching tactics.
4) The need to disambiguate the meaning of the student’s utterances.

Remembering the Obligations (OBL)

Both DP's are obliged to perform Dialogue Acts because of social/domain constraints.

Obligations help explaining/predicting the behaviour of the dialog participants in tutorial dialogues.

General features (1)

How collaborative are tutorial dialogues?

The DPs don't collaborate to achieve/complete a common task **in equal terms**

The tutor is an expert in the domain, and the student has a partial knowledge.

If the tutor realises that the student has insufficient knowledge he/she reveals gradually information to guide the student.

The tutor hasn't the obligation to answer the students questions.

Extreme of not "collaborating": If the tutor believes that the student's knowledge is too limited, he/she ends the collaboration.

General features (2)

Common dialog moves specific to TD different from DAMSL

- Acknowledge
- Action-directive
- Hints
- Align
- Check for the origin of the mistake
- Stop
- Other moves

Acknowledge

It can be implicit or not implicit.

•**Implicit:** Most common forms are ACCEPT and REJECT.

•**Non implicit:** OK, yes, all right...

Action-directive

-Do you know....?
-Do you remember....?
-Why don't you....?

The student is obliged to respond to the propositional content of the form.

Hints

Contrary to the norm in collaborative dialogue, the tutor hardly ever answers questions directly. Instead she/her gives HINTS

1) A hint takes the form of eliciting information that the student is unable to access without prompting, or information which she/he can access, but the student is not aware of this relevance.

2) Hints point to inferences that the student is expected to make based on her/his available knowledge.

(1) **T[1]:** ...What are the instructions asking you to do?

S[2]: Make a circuit between the source(battery) and the resistance (rheostat) and then attach the miliampmeter to measure the resistance in ohms.

T[3]: OK, you're close. But keep in mind that a miliampmeter is a special case of an ammeter. Do you remember what an ammeter measures?

S[4]: Amps?

T[5]: Right, very good...

Example: hint *RELEVANT CONCEPT*

Align

It checks if the information that the speaker wishes to comunicate has actually been comunicated.

(2) **S[1]:** It will blow out the circuite.
T[2]: Why du you say that?

(3) **T[1]:** You should ......,OK?

(4) **T[1]:** Do you understand this?

(5) **T[1]:** Can you see that?

Check for the origin of the mistake

The tutor asks a question to understand the student's way of thinking.

(6) **T[1]:** OK, now what's the miliampmeter telling you about? Current, voltage, or resistance?
S[2]: Resistance (FALSE!!!)
T[3]: What is it that makes you to think so?

Stop

The tutor can stop intervening and let the student carry on with the task.

Other moves

Understand Query, Ask Permission ("Could I again..."), Information Request, etc.

Which modules are needed for a ITS?

Proposal:

- Expert module
- Dialogue manager
- Plan recognizer
- Pedagogical executive

Expert module

It provides a model of the skills that the student is expected to learn.

It must provide:

1. A representation language for domain task knowledge

2. Algorithms that can use this knowledge to perform the domain tasks.

Dialogue manager

It keeps track of information about

- Who is speaking

- Task initiative

- Focus initiative

- Which steps have been done

- When a step must be redone

...

Plan recognizer

- Update of the student's model (student diagnosis).

- The student model must be updated based on student actions as well as student inaction.

- Two kinds of knowledge:

  1. correct knowledge of the tasks.

  2. buggy knowledge (common errors in the domain)

Pedagogical executive

It takes the decision what the tutor should do next:
1) What to say.
2) How to say it.

It is guided by the other three modules.

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