A decorative wavy purple line runs vertically along the left side of the slide.

Spontaneously Funny Dialogues in Human-Machine Communication

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RESEARCH QUESTIONS AND STUDY AIMS

- How does spontaneous humour occur in the state-of-the-art Russian-based dialogue assistant?
 - ✧ to make some practical observations
- In what discourse situations spontaneous humour is more probable?
 - ✧ to support studies of humor in conversations

(Norrick, 1994 ; Archakis & Tsakona, 2005; De Boni et al., 2008)
- Is there a way to detect spontaneous humour automatically?
 - ✧ to present a (draft) method

DATA COLLECTION AND (PRE)PROCESSING

- VKontakte and Facebook posts with hashtag #ЯндексАлиса
- A total of 583 dialogues collected as screenshots
- One single utterance in each dialogue considered as **punch/jab line**, others considered as context
- Discourse relations (PDTB standard) assigned manually
 - between the punch/jab line and the previous utterance (u_4 and u_3)
 - between the punch/jab line and the previous utterance by the same speaker (u_4 and u_2)

u_1 А ты что любишь кушать
What do you like to eat?

u_2 Я предпочитаю духовную пищу.
I prefer spiritual food.

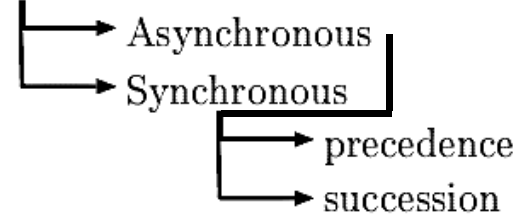
u_3 Например
For example

u_4 Салат Salad

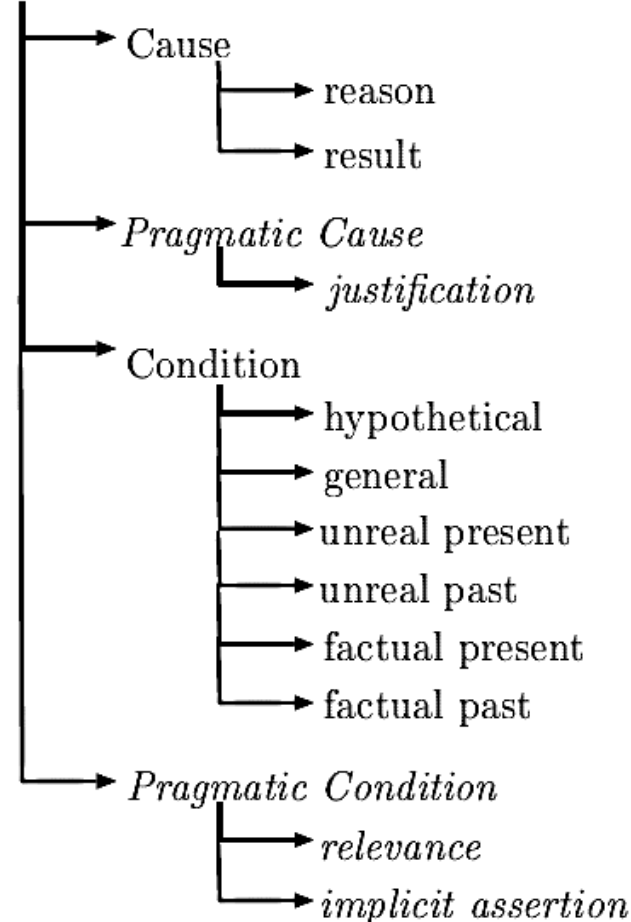
DISCOURSE RELATIONS AND KNOWLEDGE RESOURCES

- the script opposition (SO)
- the logical mechanism (LM)
- the situation (SI)
- the target (TA)
- the narrative strategy (NS)
- the language (LA)

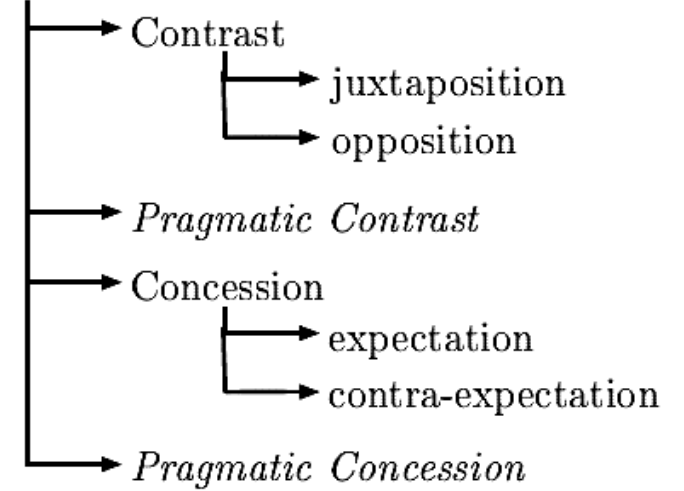
TEMPORAL



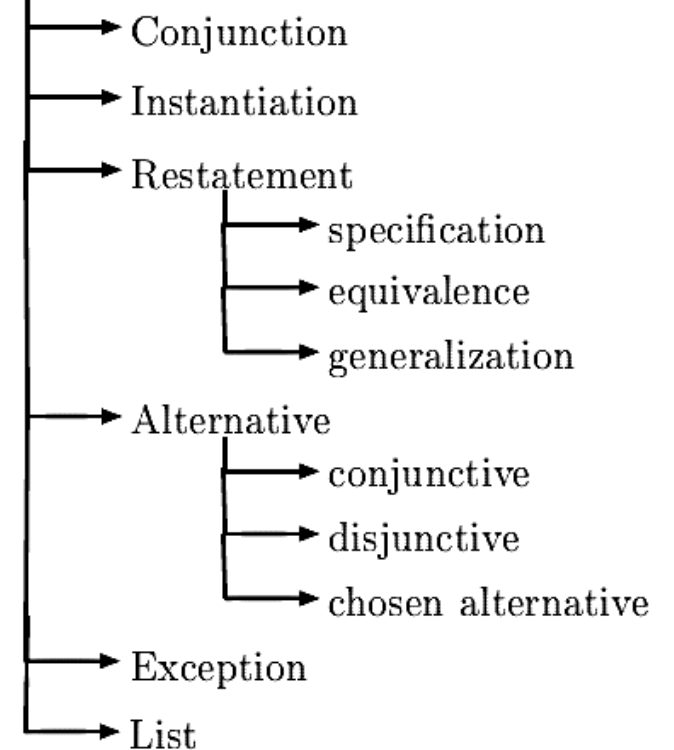
CONTINGENCY



COMPARISON



EXPANSION



EXAMPLE 1

- u_2 TO u_4 EXPANSION:
Restatement:
specification
- u_3 is a request for specification
I prefer some food, for example, salad.
- Knowledge resources:
 - **SO** spiritual vs. material
 - **LM** ontology break? oxymoron?

u_1 А ты что любишь кушать

What do you like to eat?



Я предпочитаю духовную пищу.

u_2

I prefer spiritual food.

u_3

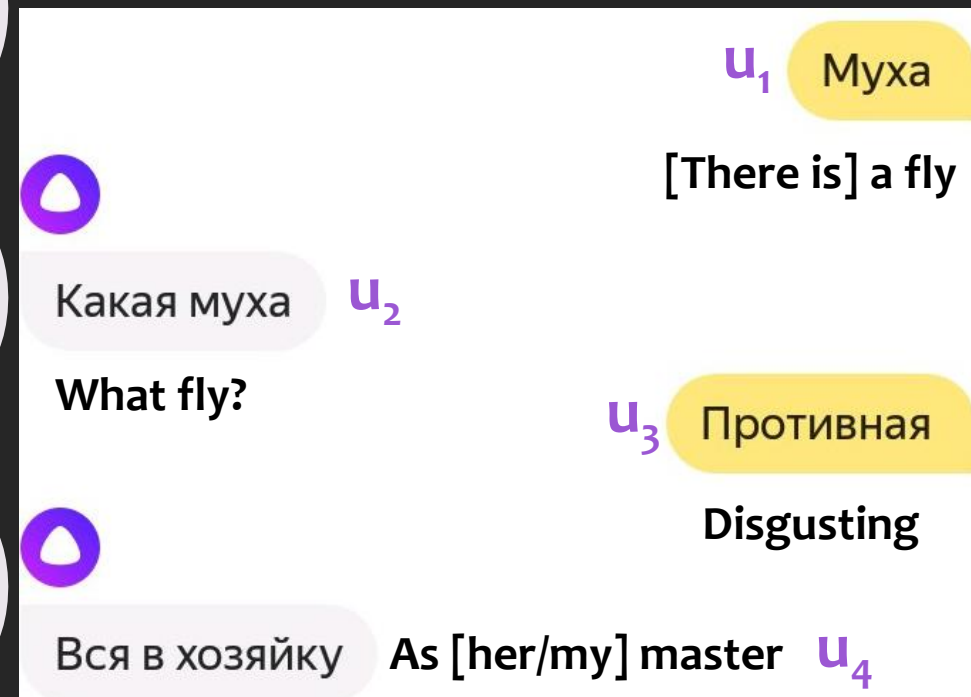
Например
For example



Салат Salad u_4

EXAMPLE 2

- u_3 TO u_4 Implicit cause
She is disgusting because her master is
- u_4 seems to be a pre-defined answer for answering insults
- Alisa, you're disgusting
- I am such as my master is
- LA anaphora problem: who is disgusting?



EXAMPLE 3

- u_2 seems to be a frequent utterance in the wedding domain
 - Implicit cause?
[I won't tell a toast because] there will be no wedding
 - **SI** missed presupposition
 - **SO** wrong answer for a request
-
- Comment by the user: “Since what time they ceased being an emergency service?”
 - Complex discourse relationship: cause and contrast
[I can't call Chip and Dale, because] I can call emergency services only, [but Chip and Dale are not an emergency service]
 - **SI** request was believed legitimate

A

u_1

скажи свадебный тост

tell a wedding toast

Свадьбы не будет

u_2

There will be no wedding

○

B

С чего начнём?

u_1

What shall we start with?

u_2

Позвони Чипу и Дейлу

Call Chip and Dale

○

Пока что я умею звонить только в экстренные службы.

u_3

For now I am able to call emergency services only

MACHINE LEARNING METHOD

$$\begin{cases} \text{cosine}(u_i, u_{i+1}) = x \\ \text{cosine}(u_{i+2}, u_{i+3}) \neq x \end{cases}$$

- Create a vector embedding for each utterance with doc2vec algorithm
In a nutshell: the closer the utterances semantically, the closer to 1 the cosine similarity
- If the cosine similarity between the context and the punch/jab line is considerably different from the cosine similarity between two context utterances, perhaps, a comic effect has occurred

Diagram illustrating a chat interface with vector embeddings for utterances:

- Utterance 1 (u_1):** "А ты что любишь кушать" (What do you like to eat?)
- Utterance 2 (u_2):** "Я предпочитаю духовную пищу." (I prefer spiritual food.)
- Utterance 3 (u_3):** "Например" (For example)
- Utterance 4 (u_4):** "Салат" (Salad)

The diagram shows the progression of the conversation, with the final utterance (u_4) being highlighted by a red box, indicating a potential comic effect due to the difference in cosine similarity between the context and the punch line.

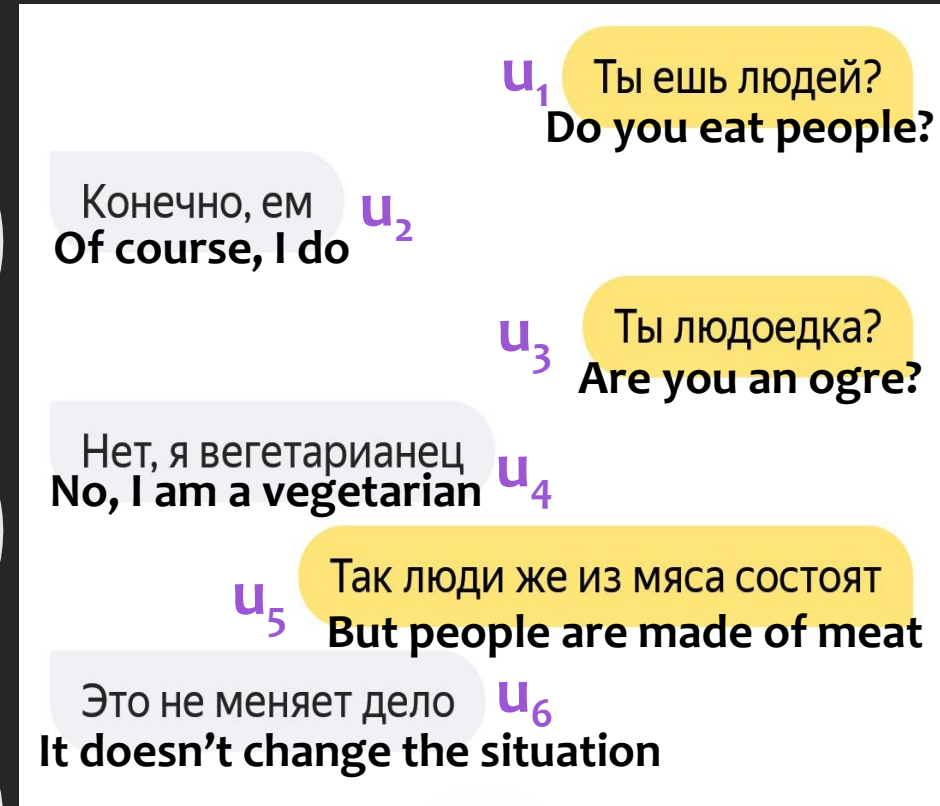
CALCULATION EXAMPLE

$$\text{cosine}(u_1, u_2) = 0.021$$

$$\text{cosine}(u_3, u_4) = 0.534$$

$$\text{cosine}(u_5, u_6) = 0.019$$

Where is the punch/jab line?



CALCULATION EXAMPLE

$$\text{cosine}(u_1, u_2) = 0.021$$

$$\text{cosine}(u_3, u_4) = 0.534$$

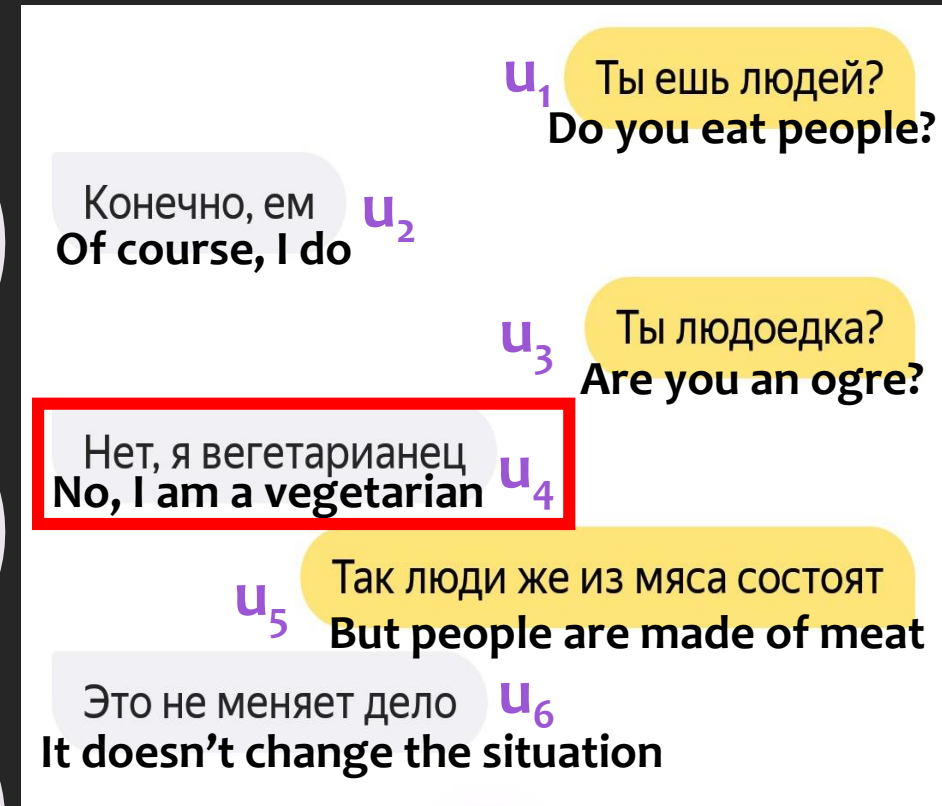
$$\text{cosine}(u_5, u_6) = 0.019$$

LA antonyms: ogre vs. vegetarian

SO being vegetarian vs. eating people

SI confirmation expected

LM see u_5 : *people implies meat*
 vegetarian implies no meat



ANOTHER EXAMPLE

- The discourse annotation revealed that the **SO** arises when comparing u_2 to u_4

$$\text{cosine}(u_1, u_2) = 0.482$$

$$\text{cosine}(u_3, u_4) = 0.445$$

$$\text{cosine}(u_2, u_4) = 0.683$$

u_1 А ты что любишь кушать
What do you like to eat?

u_2 Я предпочитаю духовную пищу.
I prefer spiritual food.

u_3 Например
For example

u_4 Салат Salad

COUNTER EXAMPLE

$$\text{cosine}(u_1, u_2) = 0.046$$

$$\text{cosine}(u_3, u_4) = 0.059$$

$$\text{cosine}(u_5, u_6) = 0.051$$

- Is there a punch/jab line?
- **LM** an assistant can't go to the store
- **SI** posted on Feb, 25
the user does not need a prom dress?

Я в магазин иду u_0
I am going to the store

u_1 Зачем в магазин?
What for [should you go] to the store?

u_2 Вещи купить
To buy some clothes

u_3 Купи мне что - нибудь
Buy something for me

u_4 Я тебе уже купила
I have already bought

u_5 Что купила?
What have you bought?


u_6 Платье на выпускной
A prom dress

RESULTS OF THE RESEARCH AND PERSPECTIVES FOR FURTHER STUDIES

- **How does spontaneous humor occur in the state-of-the-art Russian-based dialogue assistant?**
 - ✧ Most often, through SO, LM and LA – both punch lines and jab lines occur
 - ✧ Sometimes through SI, but more metadata is needed
 - ✧ Never through TA and NS
 - ➡ collect and process more data, including metadata
 - ➡ conduct surveys to determine how funny a dialogue is
- **In what discourse situations spontaneous humor is more probable?**
 - ✧ All the four major relations are represented
 - ✧ Different relations interact with different KRs
 - ➡ perform correlation analyses
- **Is there a way to detect spontaneous humor automatically?**
 - ✧ The presented method works for humour due to LA and (partly) SO and LM
 - ✧ The presented method does not work for humour due to SI
 - ✧ Automated detection impossible without DR and KR annotation
 - ➡ refine the method to detect more humour due to SO and LM
 - ➡ include DR and KR tags into training data

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Thank you!
Your comments
are very
welcome!

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