

A Web-Based Platform for Annotating Sentiment-Related Phenomena in Human-Agent Conversations

Caroline Langlet¹ ✉, Guillaume Dubuisson Duplessis¹, and Chloé Clavel¹

LTCI, Télécom ParisTech, Université Paris-Saclay, 75013, Paris, France,
caroline.langlet@telecom-paristech.fr

Abstract. This paper introduces a web-based platform dedicated to the annotation of sentiment-related phenomena in human-agent conversations. The platform focuses on verbal content and deliberately sets aside non-verbal features. It is designed for managing two dialogue features: adjacency pair and conversation progression. Two annotation tasks are considered: (i) the detection of sentiment expressions, (ii) the ranking of user’s preferences. These two tasks focus on a set of specific targets. With this demonstration, we aim to introduce this platform to a large scientific audience and to get feedback for future improvements. Our long-term goal is to make the platform available as open-source tool.

Keywords: verbal content annotation, virtual agent, sentiment analysis

1 Introduction

In the research field of embodied conversational agents, the detection of sentiment-related phenomena is a challenging task contributing to the improvement of human-agent interactions. Verbal content is more and more integrated [4]. Developing a detection system of verbal expressions of sentiments in human-agent conversations requires annotated corpora. Such corpora are rare and managing annotation campaigns appears as the first step in the development of a detection system. In order to make easier the implementation of datasets, we have created a web-based platform focusing on the verbal expression of sentiment and suited to transcriptions of human-agent conversations.

2 A Platform Focusing on Verbal Content and Conversational Structure

Focus on Verbal Content. Our annotation platform deals with verbal content, without non-verbal context. The annotator has only access to manually transcribed conversations. In this way, we aim to get information about the verbal form of the sentiment-related phenomena, for helping the design and evaluation of algorithms grounded on either machine learning or rule-based models.

Dealing with Conversational Structure. To the best of our knowledge, the sentiment analysis research does not provide annotation sets in human-agent conversation context. The existing annotation tools are mostly designed for non-conversational texts and do not deal with the specific features of conversation (see [6] and [7]). In order to fill this gap, we give attention to two important dialogue features: adjacency pairs and conversation progression. First, adjacency pairs are defined as the minimal annotation context (see Area 2 in Figure 1). Second, the annotator has the previous speech turns and their annotation (see Area 1 in Figure 1). She/he can keep in mind past information of the conversation progress while annotating a specific adjacency pair.

Simplifying the Annotation Task. Annotating sentiment-related phenomena is a challenging task. It depends on the personal subjectivity and interpretation of verbal content. This platform provides a frame which guides the annotator and simplifies the annotation process. No span of text or complex semantic features have to be defined: each adjacency pair is displayed with questionnaires asking information about sentiment expressions.

A Generic Framework. The framework relies on standard web technologies (PHP, HTML, JAVASCRIPT) and can deal with various dyadic human-agent conversation corpora. For using our annotation platform, a simple pre-processing of the data is needed to: (i) uniquely identify conversations (via a unique ID), (ii) turn each conversation into a sequence of adjacency pairs (first, the agent’s speech turn, then the user’s speech turn), (iii) in the transcription, no paralinguistic annotations are allowed, (iv) a specific set of targets must be defined (the targets can be either artefacts or animated entities).

3 Annotating User’s Sentiments and Preferences

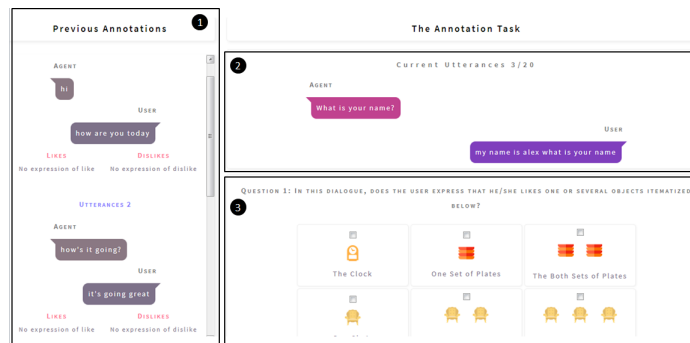


Fig. 1. Platform Overview

The platform deals with two different annotation tasks which are both key tasks in the research field of virtual agent (see [1] and [3]): (i) the detection of sentiments related-phenomena toward specific objects; (ii) the ranking of user’s preferences. As we consider that it is too difficult for a single annotator to concurrently decide which object is the target of a sentiment and which one is the most liked, the two tasks are strictly independent from each other and are assigned to different annotators. For each task¹, the framework is divided in two parts: first, the current annotation task which concerns a specific pair (Area 2 and 3 in Fig. 1); second, the history (Area 1 in Fig. 1) which comprises all the previous pairs and the related annotations.

Task 1. At each adjacency pair, the annotator has to detect an expression of sentiment targeting specific objects by filling in a questionnaire, split in two questions. The first question (see Figure 2) concerns presence of positive sentiment-related phenomena, the second, the presence of negative sentiment-related phenomena.

QUESTION 1: IN THIS DIALOGUE, DOES THE USER EXPRESS THAT HE/SHE LIKES ONE OR SEVERAL OBJECTS INVOLVED IN THE NEGOCIATION AND ITEMATIZED BELOW?

The painting

One lamp

Two lamps

One crate of records

Two crates of records

The three crades of records

No expression of like

Fig. 2. First questionnaire of Task 1

The user’s sentiments related phenomena toward an object may change during the conversation. As the task is to find expressions of sentiment within a specific pair, the annotator can check a positive expression of sentiment toward an object even if a negative sentiment toward the same object was previously noted. In this way, we will be able to analyse user’s sentiments along the conversation.

Task 2. For ranking preferences, each object needs to be scored. The score depends on the number of objects comprised in the set. In the demonstration, we

¹ perso.telecom-paristech.fr/langlet/annotationNegociation/task1, the task 2 at perso.telecom-paristech.fr/langlet/annotationNegociation/task2

use a score from 1 to 3 because the annotator has to rank preferences toward three different objects. Each score indicates the position of the object in the scale of the user’s preferences. For example, when the user verbally expresses a preference for a painting over records and lamps, the annotator can attribute to the painting the score 3 and to the lamps and the records, the score 1. Similarly to Task 1, user’s preferences may change during the conversation. As an annotation is asked for each pair, the annotator will be able to make modifications, that could be appropriate, to any score. In this way, we can follow the evolution of user’s preferences throughout the conversation.

Demonstration Outline. The demonstration will be an opportunity to test the platform with native English speakers and non-expert annotators. The visitors will be invited to annotate few adjacency pairs of a human-agent corpus [2]. In this corpus, the user and the virtual agent are negotiating over six valuable objects. “They are told that their task is to decide how to divide up these six items with another participant” [5]. Finally, by presenting the platform to an international and experienced audience, we aim to get feedback about usability and genericity of the platform.

Acknowledgements

We warmly thank Jonathan Gratch and David DeVault for sharing the negotiation corpora.

References

1. Clavel, C., Callejas, Z.: Sentiment analysis: from opinion mining to human-agent interaction. In: *Affective Computing*, IEEE Transactions on. vol. PP (2015)
2. DeVault, D., Mell, J., Gratch, J.: Toward natural turn-taking in a virtual human negotiation agent. In: *AAAI Spring Symposium on Turn-taking and Coordination in Human-Machine Interaction*. AAAI Press, Stanford, CA (2015)
3. Glas, N., Pelachaud, C.: User engagement and preferences in information-giving chat with virtual agents. In: *Workshop on Engagement in Social Intelligent Virtual Agents (ESIVA)*. pp. 33–40 (2015)
4. Langlet, C., Clavel, C.: Grounding the detection of the users likes and dislikes on the topic structure of human-agent interactions. *Knowledge-Based Systems* 106, 116–124 (2016)
5. Nazari, Z., Lucas, G.M., Gratch, J.: Opponent Modeling for Virtual Human Negotiators. In: *Intelligent Virtual Agents*. vol. 9238, pp. 39–49. Springer International Publishing, Delft, Netherlands (Aug 2015)
6. Poignant, J.: The CAMOMILE Collaborative Annotation Platform for Multi-modal, Multi-lingual and Multi-media Documents. In: *LREC 2016 Conference*. Portoroz, Slovenia (May 2016)
7. Stenetorp, P., Pyysalo, S., Topić, G., Ohta, T., Ananiadou, S., Tsujii, J.: Brat: A web-based tool for nlp-assisted text annotation. In: *Proceedings of the Demonstrations at the 13th Conference of the European Chapter of the Association for Computational Linguistics*. pp. 102–107. EACL ’12, Association for Computational Linguistics, Stroudsburg, PA, USA (2012)