Łukasz Wilkoń   Sosnowiec, dn. 14.04.2023 r.

Summary

Natural language processing and communication models in chosen crisis situations

The aim of this work is to determine how crisis negotiations differ from related types of text such as business negotiations or police interviews. The second goal is making predictions on negotiation data to learn which natural language processing task might complement a linguistic analysis of crisis negotiations. The main test data consist of the Grant Sattaur negotiation.

Chapter one discusses the main police negotiation tactics, while chapter two deals with interrogation methods. Chapter three focuses on discrete emotions in modern psychology. Dialogue speech acts, communication tropes and linguistic aspects of crisis communication are the subject of chapter four. Chapter five contains an automatic classification of crisis negotiation data carried out with the use of artificial intelligence at the sentence level and exploratory data analysis. Ten natural language processing tasks were performed using six machine learning models. Since machine learning approaches are essentially quantitative, the applied methods were quantitative as well. A statistical method was employed to analyze the quantitative indicators discussed in this work.

The exploratory data analysis made it possible to understand the main features of the text and apply appropriate parameters to the machine learning models in question. Data mining methods and tools were also used to retrieve information from social media sources. Two custom English datasets were built by using data mining and natural language processing: the suicidal ideation detection dataset and the hate speech and offensive language dataset.

The XLNET deep learning model using emotion detection revealed the prevalence of the sadness emotion class with a high number of suicidal ideation/depression sentences in the Grant Sattaur negotiation. Moreover, a large quantity of rude sentences was found. No metaphors were found and just a couple of potentially sarcastic sentences.

The automated analysis was complemented by a qualitative analysis of how specific emotions and other lexical items appear in the text and how they are invoked by the parties involved during crisis communication. Rod Fowler's crisis communication model was used to tag each Grant Sattaur negotiation sentence. Consequently, most sentences were assigned to the tranquilizing, trust-building, intelligence-seeking, and finessing tags. However, the text also contains many squelching attempts in which the negotiator uses reprimands, argues, or loses contact with the subject. A linguistic analysis shows that the Grant Sattaur police negotiation presents a mix of hard and soft negotiation strategies, with the prevalence of the latter.