



# Intent Mining of Thai Phone Call Text Using a Stacking Ensemble Classifier with GPT-3 Embeddings

Nattapong Sanchan<sup>1</sup>

## ABSTRACT

Intent mining has recently attracted Natural Language Processing (NLP) research communities. Despite the extensive research on English and other widely spoken languages, intent mining in Thai remains unexplored. This paper proposes an extended framework for mining intentions in Thai phone call text. It utilized a stacking ensemble method with GPT-3 embeddings, constructed by systematically determining based and meta-classifiers using Q-statistic and F1 scores. Overall, the based classifiers consisting of Support Vector Classifier (SVC), k-nearest Neighbors (KNN), and Random Forest (RF) were derived with a meta-classifier, Logistic Regression (LR). We compared the mining results, derived through the proposed Stacking Ensemble Classifier (SEC), to 1) the individual base classifiers and 2) the three BERT baselines: BERT Multilingual Uncased, and BERT-th, and BERT Based EN-TH Cased. The results revealed that SEC could outperform SVC, KNN, RF, BERT Multilingual Uncased, and BERT-th, except BERT Based EN-TH Cased. However, a statistical analysis conducted using Friedman and Holm's post hoc tests reported no statistically significant difference between SEC and BERT Based EN-TH Cased, inferring that the two classifiers perform similarly practically.

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## 1. INTRODUCTION

Intent Mining (also known as Intention Mining and Intent Detection) has recently attracted Natural Language Processing (NLP) communities. It involves the process of extracting intentions expressed in text. Intention refers to a concept of goals, activities, or plans a user aims to do in the future [1-2]. By knowing and understanding the intentions of users, we are characteristically able to determine the proposition and the users' needs. Therefore, a system can deliver personalized content and appropriate recommendations to users. For instance, in a textual conversation, "My daughter is calcium deficient. What can I do?" indicates the intention of the speaker who needs calcium medication for his or her child [3]. By integrating intent mining into a system, it can recommend calcium-related products to serve the customer's needs. Another example is to determine intentions underlying a sequence of actions or processes performed by a user. When a user interacts in a system, performing a series of actions to finish a particular task, [4] aimed

to observe the user's intentions underlying such actions instead of just describing the sequence of actions. Knowing users' intentions allows the system to improve the recommendation alternatives to users and the gaps between their intentions and the actions in the system. [5] exemplified an example of integrating intent mining in a movie review system. Their work enabled the understanding of reviewers' motivations, expectations, and emotions when recommending movies. Moreover, the analysis of intentions in the text also allows businesses to effectively and successfully launch marketing campaigns that align with customer's needs and desires [6], leading to critical decision-making and increased profits. Furthermore, in search engines, understanding users' intentions in searching keywords helps improve the accuracy and relevancy of search results and the efficiency of the information retrieval processes [7]. For these reasons, mining intentions in the text is exceptionally essential.

This paper aims to mine intentions in Thai phone call text. Understanding such intentions benefits

<sup>1</sup>The author is with the School of Information Technology and Innovation, Bangkok University, Pathum Thani 12120, Thailand, E-mail: [nattapong.sa@bu.ac.th](mailto:nattapong.sa@bu.ac.th)