Development of a Database of Jesus' Statements and their Artificial Intelligence(AI) applications Based on Personality Layer Mechanism

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Summary

In recent years, research on artificial intelligence (AI) has been conducted all over the world. With the rise of deep learning, AI research is attracting global attention. It is pervasive in all sorts of fields, including industry, medicine, education, and entertainment. On the other hand, despite of the prevalence, AI is said by some to have great difficulty in expressing human-like qualities. This is symbolized by the "uncanny valley phenomenon" and the 'Alexa voice data collection problem'. It is clear that even models that mimic the neurons of the human brain and complex computational processes have much difficulty in reproducing human nature. Therefore, in this research, we examine the development of a system in which the user feels 'humanness.' Specifically, we build a personality database based on the real people's statements, and then develop chatbots equipped with their personality characteristics. This time, we focus on Jesus Christ, who lived and died in history, as a case study and build a database of his personality. We selected him out of few prominent figures from the past whose public statements have survived to the present. All of his statements will be categorized by intended audience, purpose, and means to create a database and analyze his statements to represent his personality. Through thorough observation and input, we aim to design a system that makes users find more 'human' rather than unnatural qualities, which is autonomously output by machine learning and deep learning. In short, the idea is to mimic and reproduce authentic 'hu-man' personalities based on modeled human speech data: natural language. This research proposes a new method to reproduce such humanness and personality.

Key words:

Jesus Christ, Bible Media Informatics, Database, Artificial Intelligence, Artificial Personality, Online Communication.

1. Introduction

In recent years, products and technologies that make use of artificial intelligence have become more and more popular among general consumers. Artificial intelligence technology is used for various kinds of electronic devices, and it is safe to say that we cannot live life today without artificial intelligence and smart computers. On the other hand, humans have not yet achieved original purpose of artificial intelligence in the sense of 'reproducing human intelligence and intellect'. There are two reasons: the mechanisms of human personality and natural intellectual

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behavior are complex, and it is difficult to artificially create human-like qualities from scratch. This is because the 'artificial intelligence', and 'artificial intelligence produced by machine learning or deep learning' is merely a combination of learned patterns of information and the outcomes of information retrieval. The intellectual behavior (human-like behavior) that humans generate is not so simple that database search can cover it. For example, Deep Dream, a deep learning system developed by Google, is a mechanism that generates images and videos by referring to human brain functions, and focusing on 'what happens if a computer dreams'. Although it is unique, the result only emphasizes the eeriness (Fig.1). It is hard to call it a reproduction of a human's dream by any means, and it is still more difficult to call it art. This is because we do not dream dreams as a pattern of data combinations.



How about the situation with interactive systems (chatbots) that are realized using existing AI technology? To the present, Chatbots have been studied by various methods and approaches from the 1960s, when artificial intelligence research started, but they have not necessarily achieved truly 'human' characteristics.

In terms of mechanism, it basically just incorporates the stored language database and keywords that the system learned through dialogue into the grammatical structure and dialogue patterns, and is still at the level of Q&A systems and rather simple word games. In a considerable number of cases, it is unnatural as a conversation.

One of the most widespread chatbots today is Apple's Siri. While it is regarded as a practical and simple artificial intelligence with high convenience, it is generally regarded as convenient as a simple dialogue system. Although it can recommend required information by information search, it became a topic of discussion that it performs search for restaurants without even being able to distinguish between 'good restaurants' and 'not-so-good restaurants'. For example, basically the original meaning of 'not-so-good restaurant' is "good + NOT", but the system just search and retrieve all the words related to the word: 'good restaurant' anyhow. The system cannot tell whether something is right and wrong, or, good and evil.

In another case, Amazon's smart speaker "Alexa" was said to be a stand-alone device that can understood conversations and make decisions autonomously, but it turned out that information from the user is sent to Amazon employees through the device, and the humans are engaged in the final processing. This became a problem. Although Amazon explains that the reason for collecting such conversational data is to 'improve accuracy', it has been criticized as nothing but eavesdropping and some people insist that Alexa is not an artificial intelligence.

Although we call Alexa artificial intelligence or an AI assistant, the fact can mean that it is difficult for Alexa to maintain a practical level of accuracy and user satisfaction in the final step, without human intervention. It is no exaggeration to say that this problem indicates the limit that artificial intelligence research is facing today.

On the other hand, the phenomenon known as the "uncanny valley" re-mains as an issue when it comes to the realization of artificial 'human likeness'. This is a phenomenon in which the more realistic a humanoid robot or a human figure drawn in 3DCG becomes, the more uncanny and uncomfortable we feel regarding their artificial forms. Today, although various humanoids and 3DCG have been created, there is no successful case where the "uncanny valley" has been overcome.

In this study, we consider the feasibility of a computer system that reproduces humanness from the perspective of constructing a personality database, and propose its mechanism. In particular, we will approach the system realization by 'building databases for 'human' personality traits' not by learning or database search based on AI technology.

2. Purpose

2.1 Purpose of Research

The purpose of this research is to construct a personality database to realize a computer system with humanness. In particular, we believe that personality data extracted from real people as models, instead of creating virtual personality data, can create a reality that is tied to the modeled people, and this will be the back-bone of the computer system in which users can find 'humanness'.

First, for the sake of clarity, this study construct a personality database for the most famous historical figures in the world, because their personality data has already been sufficiently collected and organized. In this paper, we adopt Jesus Christ as the model historical figure. The extensive amount of data of Jesus Christ's personality has already been organized and a certain data structure has been presented by the New Testament and various research books. Many of them also make it abundantly clear what beliefs and intentions were held depending on the target audiences (common people, disciples, scribes, and etc.) and circumstances in which they were uttered. Out of the data, this study will focus on the Jesus's statements to identify his personality.

In general, the way a person uses language shows not only his or her personality and character, but also the social status in which they are. For example, an aristocrat use the language in aristocratic manner, and so is his content of speech. The common people have their own way of speaking, the sinners have their own way of speaking, and those who are sick have their own way of speaking. For example, in Japanese, there are even distinct differences between masculine and feminine language. In this research, we apply this mechanism to artificial intelligence.

The difference in statements builds a personality image. For example, we often hear that people say things like, "He (She) would say something like 'this'," or "He (She) would never say something like 'this'."

From this point of view, Jesus Christ is a quite understandable model as a case study because a lot of data on words and statements remain, and there is sufficient situational and semantic analysis for the data that have been tried so far.

There are over 1,000 statements of Jesus in the Bible. If I were to break it down into sentences, it would number in the thousands. In addition, the life of Jesus is largely divided into private and public (life before Ministry and Ministry), and by building a database for each, it becomes easy to further analyze and classify the personality traits of Jesus.

2.2 Background of selecting Jesus Christ as a model

Christianity is currently the world's largest religion with one-third of the world's population as believers. The Bible is the 'best-selling book of all time' in human history and has been translated in over 3,200 languages. In the New Testament, Jesus' words and actions are clearly recorded by his disciples. In other words, the Bible is also the most widespread history book in the world. In the New Testament, we can see not only Jesus' statements as a spiritual leader of people, but also his emotions as a human being. By reading the New Testament, we can ex-tract the thoughts and personality traits of Jesus. There are many samples in the Bible or the Gospels, which are not only external statements for common people, but also heartfelt statements that shows his personality traits, and emotional statements that can be considered fundamental to human nature. In this study, we implement those statements of Jesus Christ as a prototype of an artificial personality database system.

3. Precedent Research

3.1 Buddha BOT

Researchers at Kyoto University in Japan have developed the 'Buddha Bot' based on the concept of traditional knowledge and artificial intelligence. This is a conversational AI that gives advice on the problems and social issues of modern people from a Buddhist perspective. It uses Google's BERT algorithm to machine learn Q&As extracted from the SuttaNipata, the oldest Buddhist scripture, and output them in the form of sentences in response to user questions. This system is expected to bring not only academic value, but also industrial and religious value. While there have been existing combinations of 'AI' and 'counseling and mental care fields', there has never been one that utilizes Buddhist teachings. The developers say that the current system does not have high accuracy, but it is going to be improved in the future by learning a larger number of teachings to increase the variation of answers and to ensure that the answers are appropriate. Also, since the BOT is related to religious field, it has ethical issues. Developers are engaged in current stage of research and development to explore the possibility for coexistence of religion and AI, and to open it up to general users, while being careful of the system abuse or misuse . The developers also plan to improve the ac-curacy of the system by incorporating feedback from actual monks. This is an example of a human intervening with an AI system to reproduce 'human' qualities in respect of that the monk provides feedback. Even Google's algorithms that is representative to the current technology, and is the most advanced in the world, require human intervention. The mechanism image of the buddha bot is shown below.

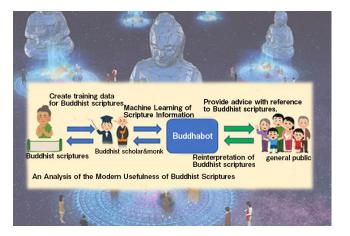


Fig. 2 Image of Buddhabot.

3.2 Holy Church Search System using Hyper Estraier Search Engine

In Humanities research, digital archives, which convert historical documents into text and store them in databases, have been attracting attention for some time. In Japan, the 'National Diet Library Search' is famous as a large-scale database of materials and articles. Some of the services allow users to search the full text of documents and scriptures housed in temples. The search engine, Hyper Estraier, which was constructed and presented by Murakawa et al. enables users to search for documents by keywords or attributes. The accuracy of the system is increased by linking multiple databases. Since CSV (Comma Separated Values) format files are used to manage the bibliographic data, updates can be done easily. It is a record of Buddhist teachings and sutras, as well as the doctrines and practices of the temple community. It is used by monks and nuns for their studies and religious activities. The image of Hyper Estraier (full-text search system) is indicated below.



Fig. 3 Image of Hyper Estraier(Full-text search system).

4. Procedure of Research

In this research, we construct a personality database to realize a computer system that enables users feel "humanness". In this paper, we specifically implement a personality database of Jesus Christ. The personality database is designed by extracting data based on the actual statements, Jesus's words from the Bible and historical documents. The database implementation is done by three steps: extraction, classification, and normalization. The specific flow is shown below.

[STEP1 : Extraction] Extract the words of Jesus Christ based on the existing materials.

[STEP2 : Classification] Classify the words of Jesus by three layers.

[STEP3 : Normalization] Perform normalization to make the words searchable as a database.

Jesus' statements are clearly recorded in the Gospels written by his disciples. Among them, the four canonical gospels of Matthew, John, Mark, and Luke are also known as the Holy Gospels in the New Testament, and are considered to be the books that convey the life and teachings of Jesus. In other words, the Gospels are a historical document that describes not only his ministry period, which is the public side of Jesus, but also his childhood.

The life of Jesus can be divided into two major parts. There are two periods of time: public (the ministry period), and private (the preparation period). The private life also has many anecdotes, which are mentioned in the Gospels, and the words of Jesus in the period also remain clearly. The

following is a rough outline of events in his private and public life.

The Life of Jesus				
Public Career(3 years)				
The first two years				
• Galilee				
 Miracles of Jesus 				
Attack from the Enemy				
The Last Week (Passion)				
The Last Week (Passion)				
Death on the Cross (Last Words)				
Death on the closs (Last words)				

Fig.4 Image of the general events of Jesus' life.

In addition to these events, it conveys Jesus' words, which are for ordinary, everyday life. Jesus' words of comfort to the sick and weak, his logical refutation of his enemies, and his astonishing remarks to his disciples are the focus of the verses. In this research, all the words of Jesus in the four Gospels were listed, the duplicated passages were removed, and the list was sorted chronologically. By creating a database, it is possible to find not only his divine aspect, which leads to the leadership or performing a miracle, but also 'human' emotional aspect. For example, there are descriptions:, the incident when he expressed anger to the merchants in the temple or his dismay when finding that the disciples whom he had told to stay awake fell asleep. Therefore, Jesus' statements will be classified by the following three major layers. Specific classifications are shown below.

(Category 1 : target) the target of the statement

- statement to God
- statement to the Devil
- statement to the Disciples
- statement to the Family
- statement to People
- statement to the Sick and Weak

(Category 2 : Purpose) the purpose of the statement

- speech for sermons or homilies
- speech for reprimand or anger
- speech for consolation or salvation
- speech for resignation or discouragement
- speech for simple replies

(Category 3 : Method) the method of the statement

- statement from parable
- Statements from Bible quotes
- Logical (rebuttal and persuasion) statements
- Emotional or angry statements
- Statements that give instructions
- Statements that ask questions

• Statements to explain

• Meaningful statements with a high level of abstraction

• Prayers to God (soliloquy)

In principle, the statements of Jesus Christ recorded in the Bible are classified by the three layers as indicated above, and the combination of these three layers will be normalized into a database that can reproduce the personality of Jesus Christ as historically recorded.

5. Implementation of Database

In this paper, the statements of Jesus extracted and classified from the Gospels were normalized using Comma Separated Values (CSV). The CSV format was adopted because it is highly compatible with general software and easy to share. In order to cover the statements of Jesus based on the Gospels, we made a list of Jesus' statements in the New Testament. Of course, they could be broken down into smaller units, but we count a series of dialogues as one. This database contains statements that covers Jesus' life from his childhood to his death by crucifixion. The number of Jesus' statements clearly recorded in books is enormous, and they have a wide variety.



Fig.5 Image of database for of Jesus' statement.

The content of the "Post" shown in Fig.3 and each item is posted to adapt to the categories and tags. Users can intuitively see Jesus' statements, as posts are automatically made that match the CSV content. There are 1098 rows and 12078 data sets, and they can be searched by three categories. The number of subclassified data sets upon category 1 is indicated below.

monologue	-	monologue	3
Speech to God	-	speech-to-god	28
speech to the devil	-	speech-to-the-devil	7
speech to the disciples	-	speech-to-the-disciples	629
speech to the enemy (scribes and Pharisees)	-	speech-to-the-enemy- scribes-and-pharisees	209
speech to the family	-	speech-to-the-family	4
speech to the masses	-	speech-to-the-masses	138
speech to the sick and weak	-	speech-to-the-sick-and- weak	57

Fig.6 Category1 image.

In Category 1 the items are about the target of speech.It refers to the target whom Jesus' statement is aimed at. The subcategories are disciples, enemies, people, the weak, the sick, family, the devil, God, and self-talk. Depending on the target, the content of the statement naturally changes. For example, the statements to God is basically a prayer to God. However, the statements to disciples does not necessarily mean 'teaching'. The distinction among them can be clarified by comparing Classification 2 and Classification 3 each other. Category 2 is shown below.

statements for comfort or salvation	-	statements-for-comfort-or- salvation	135
Statements for preaching or good talk	-	statements-for-preaching- or-good-talk	797
statements for reprimand or anger	-	statements-for-reprimand- or-anger	14
statements for resignation or discouragement	-	statements-for-resignation- or-discouragement	100
statements for talking back t the other person	o —	statements-for-talking- back-to-the-other-person	29

Fig.7 Category2 image.

In Category 2, the items are related to objectives. There are two types of statements in Jesus' statements: carefully craftted and well-planned statements, and emotional statements. Crafted statements include sermons, homilies, other moral story and comforting remarks. On the other hand. emotional statements include resignation, discouragement, anger, and reprimand. Apart from these, there are also statements that are just replies and they are neither emotional nor planned. For example, Jesus' statement to the Pharisees: "Whom are you looking for? For example, Jesus' statement to the Pharisees, "Who are you looking for?" is merely a conversation starter and has no particular meaning. It is a statement that is based on basic human communication flow, and it is not a statement that is

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unique to Jesus. From these, Category 2 has five subcategories in total.

In Category 3, the items are about means. The art of conversation is a topic that gathers people's attention always including today. Jesus' had extraordinary speaking skills. In fact, his words were heretical to the Judaism of the time, but he fascinated the public as well as his disciples. At the heart of his skills was Jesus' use of different means for speech; parable, quotes from the Bible, logical statements (rebuttal or persuasion), statements that express emotion or anger, statements that give instruction, statements that cast questions, explanatory statements, statements that are highly abstract and meaningful, and prayers to God (soliloquy). The subcategories for statements that focus on the means are indicated below.

abstract and meaningful statements	-	abstract-and-meaningful- statements	18
Asking questions to find out from others	-	asking-questions-to-find- out-from-others	49
Emotional statements	-	emotional-statements	334
explanations and preliminaries	-	explanations-and- preliminaries	80
For example	-	for-example	301
Logical statements (refutation and persuasion.)	-	logical-statements- refutation-and-persuasion	119
Pray to God	-	pray-to-god	31
Statements from Old Testament quotations	-	statements-from-old- testament-quotations	34
statements that give instructions	-	statements-that-give- instructions	111

Fig.8 Category3 image.

With the classification 1, 2, and 3, we think that we can roughly identify Jesus' personality.

6. Usage Method

This database allows users to classify the statements of Jesus by three layers (three sets of subcategories). By showing Jesus' statements as they are as plain as possible without interpretation, we can avoid mistranslations and we do not go for free translations that are common in modern books. The use image is shown below.

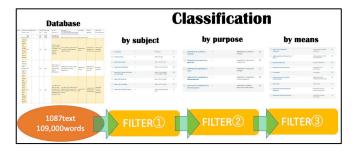


Fig.9 Use image.

Users can use any of subcategories upon three main categories to narrow down the statements of Jesus. Upon each main category: 'target', 'purpose', and 'means', users can see what Jesus said in the from that has not been freely translated. For example, if you want to see the 'parables' of Jesus, you can use the 'parables' filter to find them upon 'means' category. This indicates that users can narrow down their search in 360 ways (8 x 5 x 9), and they can find Jesus statements according to their needs, more accurately than any other collections of Jesus statements.

7. Classification and Analysis

In this paper, we will the statements of Jesus Christ based on his personality into three categories as a personality database that feels "human". Then we will analyze data distribution of items (subcategories) upon each main category. Category 1 refers to the targets of the statements. The number of characters who appear in the Gospels are countless, but the targets of Jesus' statements basically fall into eight subcategories. The most common is the statements to the disciples. The twelve apostles, in particular, lived and worked with Jesus, and a lot of the statements to them remains. This is probably because it was the disciples themselves who created the original documents for the Gospels. We believe that the target classification of speech is easiest, but the most important. Disciples, enemies, people, the weak and sick, God, the devil, family, and soliloquy are common in order of descending prevalence. Out of them, we can see that 'statements to disciples' account for almost 60%, and only 13% of the statements are for 'people'. Jesus has the image of caring for the weak and sick, but his actual statements to them, is only 5% of all the statements. The following chart shows the overall distribution.

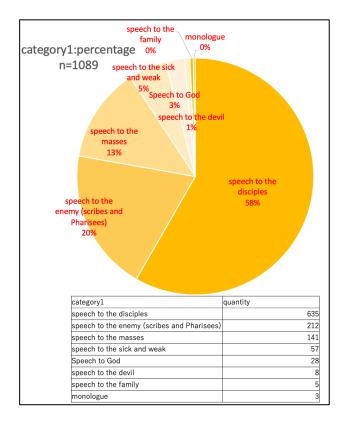


Fig.9 Category1:target distribution ratio.

Category 2 is a classification based on the purposes of the statements. Human beings tend to speak with some kind of intention. This is a classification that focuses on this point. There are five main types of statements made by Jesus. The most common are sermons and homilies, or moral stories. As there were many statements to the disciples upon Category1: (classification by targets), it is thought that there are many statements that teaches something. There are also the statements that actually mean just the replies, which do not contain much meaning, Category 2 distribution ratio is shown below.

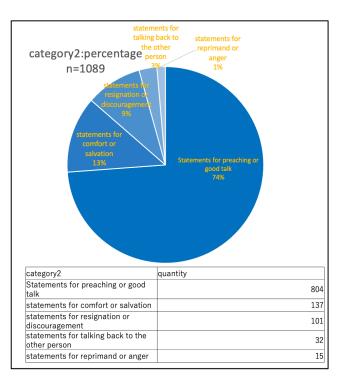


Fig.10 Category2:purpose distribution ratio.

The reason for the large number of 'sermons and homilies' (74%) is clearly because of the large number of statements to disciples. The words of comfort (13%) is also not surprising, considering the number of statements made to the weak and sick. There are also 10% emotional statements in total (9% giving up or discouragement and 1% anger or reprimand). So we can see that a tenth of Jesus' statements in the Gospels are emotional. However, since the Gospels are a collection of the best of Jesus' remarks, we can assume that he actually said something that expressed his emotions a lot more. We can see that Jesus spoke and behaved in an emotional, or 'human' way.

Category 3 is a classification based on the means of speech. Jesus was said to be a master storyteller. The characteristics that grab the public attention can be attributed to this wealth of means of speech. In other words, we believe that Jesus had a variety of speech techniques. Particularly common was the use of metaphors. Jesus used a lot of parables to make it easier to understand for people and disciples. There is a scene in the Gospels where a disciple asks Jesus a question about it. The famous parables have been passed down as a lesson. The following chart shows is a diagram of the overall distribution of Classification 3.

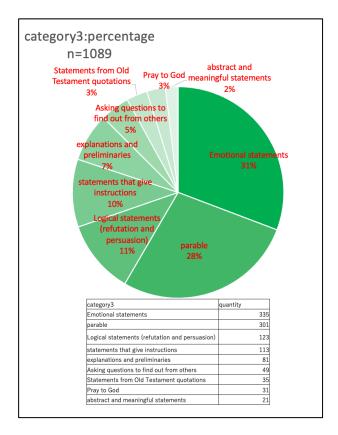


Fig.11 Category3:speech technique distribution ratio.

Classification 3 has more types than the other classifications. This is because Jesus switched the way he spoke. Not only did Jesus change the way he spoke for each target, but he also switched his speaking techniques. He did not speak in tedious and difficult way, instead, he went for rather emotional way. In fact, 31% of the statements made by Jesus, regardless of 'to friend' or 'to foe', were statements that appeal to the targets' emotion. This is followed by parables (28%) and logical statements (11%). From these, we can say Jesus is conscious of speech method to make what he say easy to understand for good communication. His statements that sometimes appeals to targets' emotion, and other times are logical, with parables must have fascinated not only his disciples, but also even his enemies (Pharisees and priests). The number of statements that give instructions is 10%. This includes "pour water" and "follow me" as well as guiding statements such as "fish here". Prayers to God (soliloquies), quotations from the Old Testament, and other methods of supplementing the story are also seen, though the number of them is quite small.

8. Conclusion

In this paper, we attempted to extract the personality of Jesus Christ from his remaining statements. After compiling

and categorizing more than 1000 statements, a database was constructed. Based on the concept that "personality lives within the words" the database site covers the Jesus' words and has a search function that allows users to narrow down the search by subject, purpose, or mean. The database alone is highly useful, and we believe it will be useful for other Jesus studies in the future. However, the goal of this research is AI application with humanness. Therefore, it is assumed to be used like existing artificial intelligence, but the database of the system is completely different. Existing AI generates statements based on conversational patterns assumed by the developer. Other than that, there are also other existing AIs that output messages autonomously by machine learning, but their databases are simple collections of statements, which results in very limited conversations. There is no other example of a database that lists all the statements of one real person. This is because the statements of the living (lived) people are regarded as less applicable. Few people would think that Jesus' statements can be versatile to everyday life or business. However, that does not apply only to Jesus. No one is capable of making statements that apply to everyone. Therefore, in this research, we focused on extracting Jesus' personality in which we would be able to feel "human" to the fullest extent considering the required conditions for the database construction, although the scope of use is limited. Humans can tell if something is human or not. It is symbolized in the "uncanny valley" phenomenon. Regarding the actual statements of Jesus, we naturally feel "warmth of personality". Based on this the database was constructed.

9. Future Work

In the future, we will develop a chat BOT with 'human' qualities based on the database from this research. There are many problems with the existing chat BOTs. This is mainly because we cannot feel this 'humanness' in the existing system, which results in formulaic answers and incoherent conversations. The database in this study contains external and emotional statements of real person. The public and private aspects are easy to distinguish, and it is easy to understand how the personality is structured. There were various kinds of statements: charismatic statements that charmed the public attention, statements that emotionally lectured his students, and statements that logically refuted his opponents. Our database was an attempt to identify personality from his statements by classifying them according to whom they were directed at, what their purpose was, and by what means (methods) they were made. By applying this database to AI, the system design will enable users to feel more 'humanness' than existing systems. Specifically, it is envisioned to be used as a sermon BOT using the Jesus database and as a counselor beyond the dialogue system. It is not applicable to all conversations, but it is also the case even for the database of ordinary real people. The uttered words of Jesus were difficult to understand for even his disciples, and his personality was with ideas that contradicted the common sense of the time. However, it may be such statements and personality in which 'humanness' resides. This research is related to religious studies and history, but is basically a different field. Therefore, for the statements of Jesus, we have built a database based on the Holy Gospels. However, there are other Gospels besides the Holy Bible, such as 'The Gospel of Thomas' and 'The Gospel of Judas', and some people believe that the origin of Jesus and his personality can be found more in the external sources. Further exploration for the Jesus' personality can be considered as future research.

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