

## **A Study of the Cultural Representation of the Integration of Song Lyrics Music and Confucianism**

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**Abstract:** Song lyrics music is not only a form of text, but also an art form that is deeply integrated with music, and its musical features have many connections with Confucian thought and culture. This study is based on the LDA theme model to mine and extract the relevant theme word frequencies of the cultural expression of Confucianism in Song lyrics music, and the LDavis visual theme tool shows the results of the LDA theme model analysis, and based on the results, explores the cultural expression of the fusion of Song lyrics music and Confucianism. The results of LDA theme model mining and analysis show that there are four clusters in the theme of cultural expression of the integration of Song music and Confucianism, among which the total distribution probability of "benevolence" and "etiquette" in Confucian culture is 6.60% and 4.90%, respectively, indicating that the Confucian idea of "benevolence and righteousness" also has a significant influence on Song poetry and music. This paper's study of cultural performance under the fusion of Confucianism and Song lyrics music can provide some reference for modern researchers of Song lyrics music as well as Confucianism literature.

**Keywords:** LDA Theme Model; Song Lyrics Music; Confucianism; Cultural Performance.

### **1. INTRODUCTION**

In the Song Dynasty, with the development of social economy and the improvement of people's living standards, culture and art were vigorously developed. Among them, music as an important form was loved by people and became an indispensable part of social activities and banquet entertainment (Ye & Li, 2024). Meanwhile, the Song Dynasty was an important period in the development of Chinese classical poetry and lyrics, among which Song lyrics are the most famous (Li, 2019). In Song lyrics, the combination of music and literature was widely used, forming a unique artistic style. Song Lyrics is a kind of musical literature, and musicality is one of its important artistic characteristics, and the influence of music is

always accompanied in the development of Song Lyrics (Zhang et al., 2021). First of all, it is the production of music and words. In addition to the birth of poetry and social factors, the word is mainly due to the introduction of music, the nature of the sound of this lyrical music is entertaining and varied, and the words and phrases of the law are very neat, the two do not match, so the musicians will be played to “loose sound” to make the neat sentence into a different (Xiang, 2018; Zhang & Chonprirot, 2024). But this for poetry and music group carries still can not be completely removed, so rich in creative folk poets will be further in the neat five, seven words outside the form, according to the sound of the music of the complex changes in the creation of new lyrics of the syntax of the differences, the creation of this new lyrics is the birth of the word (Schoenberger, 2024). Confucianism, the kernel of traditional Chinese culture and the theoretical basis for maintaining the authoritarian rule of feudal monarchs, originated in the Spring and Autumn and Warring States periods. As the founder of Confucianism, Confucius created the Confucian system of thought and had a profound influence on the development of ancient culture (Goldin, 2017). Confucianism focuses on morality, ethics and etiquette, and it emphasizes the relationship between people and the establishment of social order, believing that the behavior of individuals should follow a set of social virtues and standards of personal conduct, and that people should advocate good personal character and uphold correct moral concepts (Yuan et al., 2023). This is similar to the aesthetic consciousness of ancient poems. When the ancients composed poems, they often dealt with interpersonal relationships as well as their own situations and ways of doing things, which is also typical of Confucianism (Han, 2013). In a sense, what kind of humanistic spirit, what kind of art, what kind of music. Confucianism, the deepest influence on Chinese culture, is also the philosophical source of music thought. It pays attention to the role of music in human cultivation and education, emphasizes the correlation between the beauty of music and morality, and advocates the correct appreciation and creation of music, as well as the relationship between music and other forms of art (Liu, 2013; Tan, 2018). Confucian music thought is inspiring and educational, providing valuable references for later music theory and practice. Whether it is Song music or Confucianism, both contain cultural expressions, and how the culture under the fusion of the two will unfold is a subject worthy of in-depth investigation. In this paper, we first analyze the relationship between music and cultural fusion from two aspects: the material basis of fusion and the principle of assimilation, and based on the principle of fusion of the two, we propose the LDA theme model to explore the cultural expression in the

fusion of Song lyrics music and Confucianism. The LDA model is used to categorize the themes in the collected Song lyrics music-related materials, and excavate the deeper meanings to obtain the hidden themes, collect and screen the textual materials of Song lyrics music integrating Confucianism according to the results, and sub-code and screen the theme words. And the Dirichlet distribution in the LDA theme model is used to simplify the model derivation and optimize the overfitting problem of the theme model. Subsequently, the perplexity function is used to determine the optimal number of theme clusters, and then the LDAvis visual theme tool is used to analyze the distribution of the cultural expression themes of Song lyrics music fused with Confucianism, and to explore the expression of Confucianism in Song lyrics music according to the probability of occurrence of Confucianism's cultural theme words.

## 2. ANALYSIS OF THE RELATIONSHIP BETWEEN MUSIC AND CULTURAL INTEGRATION

### 2.1 Material Basis for the Integration of Music and Culture

The fusion of music and thought is an art that indirectly-directly reflects the object, and although it does not possess the objectivity of visual plastic arts such as painting, it possesses the exact imaginative visual plasticity due to its own material material with its archetypes. Therefore, the fusion of Song lyrics music and Confucian ideology and culture is an art that can reflect the various characteristics of the object to the greatest extent possible. Song lyrics music and Confucianism fusion material basis determines the reflection of objective reality in it. The material material of Song lyrics music comes from vocabulary and sound, which are not semantic and descriptive, resulting in the reflection of objective reality in it being conceptual and vague in meaning. The material material of Confucianism is symbolic and symbolic words with archetypal basis, so the reflection of objective reality in it is specific and clear. However, the ability of any art to express the object is limited. The strengths of the objects expressed in the fusion of Song lyrics music and Confucianism are exactly the shortcomings of each other, and this has become the point of fit for the combination and development of the two.

### 2.2 Music and the Principle of Cultural Assimilation

In ancient times, there were four books and five sutras, of which there were six, namely, Poetry, the Book, Rites, the Book of Changes, Music and the Spring and Autumn Annals, but only the sutra of Music has been lost.

This shows that the idea of emphasizing “music” was belittled. "Poetry and words, songs and words, sound and harmony", originally relying on the interrelationship between "words", "eternity", "sound" and "law", layer by layer to make the relationship between poetry and music close, from the loss of the "music" scripture, to people then ignore "eternal", and then "sound" and "law". Poetry and music are interdependent, "music language is passed on as poetry", it is not that "music language" is lost only poetry, but poetry and music are no longer the symbiotic relationship in the first stage, poetry and music have begun to develop independently, and there is a subordinate, primary and secondary relationship between the two, this relationship is not an absolute relationship between "music" and "poetry" or "poetry" and "music". In the second and third stages, when the ideology was clearer, due to the difference in the division of labor - poets and musicians, the difference in the style of the genre - poetry, lyrics and music, the difference in the creative process - the influence of the poem and the music. -the influence of filling in lyrics according to songs or composing songs according to words, etc., a subtle and complex relationship between poetry and music emerged. The combination of music and culture is most typical in Chinese history with the Han and Wei musicals, Tang and Song poems, Yuan operas and Ming and Qing operas, and the literati's participation in the creation of these styles of combining music and literature towards standardization and systematization, and in the process of development numerous genres, styles, and compositional techniques have appeared. .... All of this has provided the expression of the fusion between music and culture All of these provide variable parameters for the expression of the relationship between music and culture. From these parameters, we can grasp the way in which the music of Song lyrics was integrated with Confucian ideology and culture during the Song dynasty, and thus explore the relationship between the two.

### 3. THEMATIC ANALYSIS METHOD FOR CULTURAL EXPRESSION BASED ON LDA MODELING

#### 3.1 LDA Topic Modeling

Topic modeling (Zheng et al., 2025) is a statistical model for clustering the implicit semantic structure of Song music in an unsupervised learning manner. Topic modeling has been mainly used in semantic analysis and text mining problems in natural language processing. Topic models as a probabilistic generative model or generative model of text content, such as latent semantic analysis (LSA), probabilistic latent semantic analysis (PLSA) (Ahmad & Laroche, 2023) and LDA are widely used in the fields of text

topic mining, text categorization and clustering, text retrieval, and content topic evolution, etc. The LDA (Gao et al., 2024), which mainly contains the three-layer structure of lexical items, topics, and Song lyrics music, is a classical Song lyrics music topic generation model. The generation and development of LDA has gone through several topic modeling methods such as TF-IDF, LSA, pLSA, etc. The LDA topic model adopts the Dirichlet distribution (Li et al., 2024) to simplify the derivation process of the model, and avoids the problem of overfitting generated by the LSA and PLSA models. As the most widely used and representative topic modeling method, LDA has been widely used in scientific literature intelligence analysis, which includes topic identification, topic evolution, emergent topic discovery, and disciplinary cross-topic identification, etc. LDA model has its own unique advantages and features. Firstly, the LDA model can reduce the looseness of the text by classifying words in the text thereby reducing the difficulty of categorizing the text. Secondly, LDA model can dig out the deep meaning hidden under a large number of non-structured lines of text, and come up with the hidden themes. Therefore, LDA topic model is widely used and important in the field of text mining. In the context of the current digital era, the LDA theme model will be targeted to improve the processing efficiency and effectiveness of Song lyrics music. LDA theme model theme discovery is firstly carried out to collect and screen the content, and organize the Song lyrics music text data. Then the data preprocessing, selecting suitable words sub-word coding for lexical screening, the meaningless and unwanted auxiliary words and other words into the deactivation word list. Adjust the model parameters according to “text-topic probability” and “topic-feature word probability”. Finally, according to the perplexity function, the optimal number of topics is selected for the purpose of topic discovery. To help better understand the fitted LDA model, LDAvis is a web-based interactive topic visualization tool. The visualization method provides a global view of topics mined and how they differ from each other while allowing insight into the keywords that are highly relevant to each topic. Bischof and Airoldi proposed a ranking of the keywords for a given topic, the that topic and the exclusivity of that keyword to the topic, which explains the importance of that keyword in that particular topic, excluding the influence of that keyword in the text of other topics. A similar measure is taken in LDAvis by the relevance of the keyword to the topic, allowing the user to flexibly rank keywords based on the usefulness of the explanation of the topic. The keywords are ranked in LDAvis based on their relevance to learn the best tuned parameters in the relevance calculation. Setting  $\alpha=1$  leads to a descending ranking of the topic feature words according to their topic-

specific probability, while setting  $\lambda=0$  ranks the keywords according to their ascending order only. LDavis can visualize the distance between each topic to judge the relevance between the topics of Song lyrics and music and Confucianism thought, and additionally by using the topics' keywords can be judged to the degree of content overlap between the topics. The left panel of the LDavis visualization shows a global view of the topic model, reflecting the correlation and fit between the topics. The right panel displays horizontal bar graphs to indicate the frequency of occurrence of a word in different corpora and its corresponding topic.

### 3.2 Theoretical Basis of LDA Model and Determination of the Optimal Number of Topics

#### 3.2.1 Theoretical Basis of LDA Modeling

The LDA topic model is a probabilistic generative model, which constructs a three-layer Bayesian network structure by assuming that the parameters of the music-Confucian theme distribution and the theme-vocabulary distribution of Song Ci obey the Dirichlet distribution. Generative models refer to those models that reflect the generative relationship between a given input and the output of the model, so that the LDA model can randomly generate some meaningful observations with a given prior parameters. If you want to compose a Song ci music, the probability of each word in the text information is  $P(\text{Words} / \text{Documents}) = \sum \text{Subject } P(\text{Item} / \text{Subject}) * P(\text{Subject} / \text{Documents})$

The "Song Ci Music-Confucian Terms" matrix represents the probability distribution of each Confucian cultural related term in a certain Song Ci music. The Topic-Item matrix represents the probability distribution that each term represents a topic. The "Song Ci Music-Theme" matrix represents the probability distribution of each Confucian ideological and cultural theme appearing in a certain Song Ci music. The basic idea of the LDA model is to use the bag-of-words model as an assumption premise. The so-called bag-of-words model is like disorganizing all the word items in Song lyrics music and placing them inside a closed bag, assuming that the positions of the word items can be randomly exchanged, and that the order in which each word item appears is not taken into account. The real significance of the bag-of-words hypothesis is the ability to convert textual information into digital information that can be easily modeled.

#### 3.2.2 Method for Determining the Optimal Number of Topics for LDA Models

Choosing the optimal method for the number of topics will directly

affect the effect of subsequent topic mining. The method used in this paper is the perplexity degree indicator. Confusion degree is generally used to assess the degree of merit of the LDA topic model, which can quantitatively evaluate the performance of the LDA model, i.e., the lower the confusion degree indicates the stronger the model generalization ability under the number of topics.

#### 4. ANALYSIS OF SONG LYRICS MUSIC AND CONFUCIANISM FUSION CULTURAL EXPRESSION

##### 4.1 Data sources and Processing

##### 4.1.1 Sources of Song Music Data

The data in this paper comes from the GitHub public dataset, and the specific data summary of the GitHub public dataset is shown in Table 1. A total of 732,267 classical poems and music were collected in this dataset, in which the distribution of historical periods is from the pre-Qin Dynasty to the modern era (the division of historical periods in this paper is not refined, for example, it does not present the Xixia and Jin dynasties in Chinese history). This data basically includes the classical poems and music that have been recorded in the literature and are relatively complete. The number of Song lyrics and music includes a total of 254,635 songs, and the number of authors is 8,564.

Table 1(a): The Distribution of Classical Poems and Music in the Data

Historical Period	Time Span	Poems	Author Number
Pre Qin	Old stone period~221 years	584	15
Qin	The first two thousand two to 207 years ago	6	5
Han	202 years ago~220 years	254	78
Wei Jin	220 years~420 years	1263	263
South and North	420 years~589 years	5246	452
Sui	581 years~618 years	1526	95
Tang	618 years~907 years	42564	2546
Liao	907 years~1125 years	26	12
Song	960 years~1279 years	254635	8564
Yuan	1271 years~1368 years	38654	1352
Ming	1368 years~1683 years	265341	4952
Qing	1636 years~1912 years	95634	9452
Modern Times	1840 years~1949 years	26534	856
Summation	——	732267	28642

##### 4.1.2 Data Pre-Processing

Song lyrics music data preprocessing mainly includes cleaning out the

data that do not meet the conditions in the original dataset (e.g., the data of some words that are displayed incorrectly), word splitting, and making a deactivated word list dictionary. In this paper, we first use Excel to manually data clean the original Song lyrics music obtained. The purpose of data cleaning is to make the data meet the requirements of the format needed for model calculation and to represent it in a structured form, and then after word splitting, the deactivated word list and dictionary are produced. Finally the dataset that satisfies the LDA model calculation is obtained. The following are the main steps of data preprocessing in which word splitting and making deactivated word lists and dictionaries is a cyclic process. Lexical separation is an essential part of thematic modeling analysis, and accurate separation plays an extremely important role in the correct understanding of classical poems. Chinese lexicographic methods can be roughly categorized into three types: statistical lexicography, comprehension lexicography, and lexical lexicography. At present, there are many domestic tools that can be used for word separation, such as Jieba, SnowNLP, Hanlp, PKUSeg, LTP, THULAC, BaiduLac and Aliyun NLP, etc. In this paper, we compare a few commonly used word separation tools in Python for word separation of Song lyrics and music in order to check their effects. The different results of the participle may cause the ambiguity of the sentence, making the participle ineffective. The reason for this is that most of the commonly used Chinese natural language processing toolkits are based on the modern Chinese corpus training of the participle model, which has a limited effect on cutting the Song lyrics. Jiayan, which means “oracle bone language”, is an NLP toolkit that focuses on ancient Chinese language processing. When using Jiayan to split the lyrics of Song music, we can see that even though there is a certain degree of information loss, the result is significantly better than the results of other splitter tools. At the same time, in order to facilitate the clustering of cultural expression word themes related to Confucianism in Song lyrics music, this paper eliminates Song lyrics music that is not related to Confucianism culture, and finally analyzes the cultural expression of Song lyrics music and Confucianism fusion. The analysis of the number of Song lyrics music themes related to the integration of Confucianism is shown in Table 2. 254,635 Song lyrics music with the integration of Confucianism culture include a total of 87,035 Song lyrics with a total of 1,979 authors. Among the Song lyrics music fused with Confucianism, the number of love themes and historical themes is higher, 19,526 and 26,354 respectively. It is also found that the average word count of Song lyrics music is around 54.66 words.



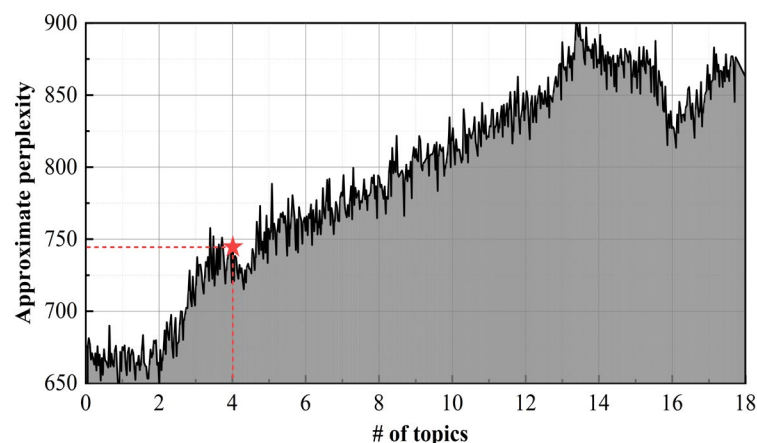
Table 2 The Song of the Confucian Thought is Analyzed

Subject Category	Song Word Music Quantity	Author Number	Average Vocabulary
Love	19526	254	55.36
Parting	15246	526	58.5
Plants	6325	52	52.12
Landscape	13658	362	51.01
History	26354	632	54.6
Patriotism	5926	153	56.36
Total	87035	1979	54.66

## 4.2 LDA Model Implementation

### 4.2.1 Results of the Analysis of the Optimal Number of Themes

Determining the optimal number of topics for text clustering is particularly important for subsequent analysis, and the determination of the optimal number of topics by the perplexity degree is a feasible method. According to the elbow method, when the curve is located at the lowest inflection point where the perplexity degree is minimized is the location of the best theme. The line plotting the perplexity degree versus the number of themes for Song lyrics music in the Song dynasty period is shown in Fig. 1. It is found that when  $K^*$  is taken as 2 (the approximate perplexity value is 662.15), the theme granularity is too large and the themes are too concentrated. When  $K^*$  is taken further back, the granularity is too small, the themes are too scattered, and all the practical significance of the analysis is lost. After repeated testing, this paper takes the position of the second elbow break, i.e.,  $K^* = 4$  (approximate confusion value of 744.40).



**Figure 1:** The Music Confusion and the Best Topic Number Analysis

### 4.2.2 Experimental Results of LDA Topic Modeling

After completing the determination of the optimal number of topics for the LDA model, this section proceeds with the experiments on the LDA topic model. Taking the number of 4 themes as a starting point, it is

observed that most of the words related to the fusion of Song music and Confucianism in the distribution are rich in depth semantics, and they accurately map the core theme and main spirit of the cultural expression of the fusion of Song music and Confucianism. Probability of Distribution of Topic Terms and Theme Terms the results are organized as shown in Table 3. The keywords in Topic 1 include "benevolence" (19.40%), "etiquette" (18.50%) and "harmonious order" (13.50%), and the keywords in Topic 2 mainly include "fairness and righteousness" (13.00%), "golden mean" (8.90%), "honesty and trustworthiness" (7.30%) and "diligence" (6.60%).

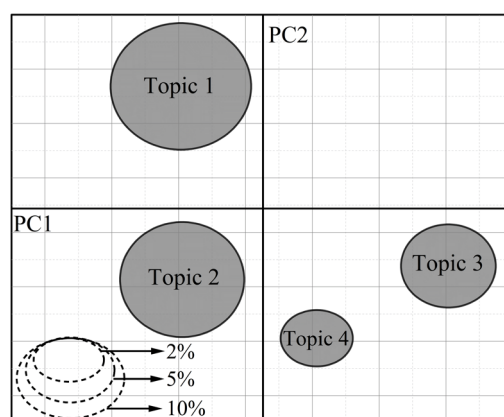
Table 3: Cultural Expression Theme Analysis Results

Theme	Subject Matter	Probability
Topic 1	Benevolence	19.40%
	Courtesy	18.50%
	Harmony and order	13.50%
Topic 2	Fair and fair	13.00%
	The middle way	8.90%
	Honest faith	7.30%
	Do one's duty	6.60%
Topic 3	Modesty and caution	5.10%
	Filial piety	4.90%
Topic 4	Innovate	2.80%

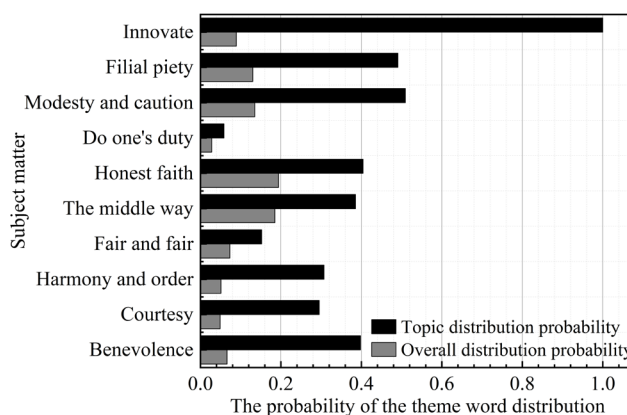
#### 4.2.3 Visualization of Results on the Theme of Cultural Expressions

The results obtained after the visualization of the LDA theme analysis results are shown in Figure 2, (a) and (b) represent the visualization mapping of the theme of the cultural expression of the fusion of Song music and Confucianism with the distribution of the keyword word frequency under each theme, respectively. The results of theme mining and visualization analysis show that in the four quadrants of the theme, the four themes cluster apart significantly, which indicates that different themes can be independent of each other, suggesting that the clustering of the themes is more effective. The black bar in Fig. (b) is the total word frequency of the keywords appearing in the cultural expression of the fusion of Song music and Confucianism, while the gray bar is the word frequency of the keywords of the cultural expression generated in the theme, which can provide an intuitive understanding of the distribution of the theme words in the theme of the fusion of Song music and Confucianism in the cultural expression of the fusion of Song music and Confucianism. The total distribution probability and the distribution probability of the theme word "the middle way" in the music of Song lyrics are 18.50% and 38.54%, respectively. Under the integration of Confucianism, the music in the music of Song lyrics embodies a kind of middle-range music but not obscene

state. This is because Confucianism advocates mediocrity in behavior and handling of affairs, and also takes mediocrity as the joy in appreciating music. Moreover, Confucianism emphasizes the importance of the “principle of mediocrity”, i.e., the moderation of the expression of emotion, which requires that in the music composition of Song lyrics, the mediocrity of emotion should be grasped to facilitate the cultivation of the heart and the health of the body. In terms of the cultural expressions of Confucianism's “benevolence” and “propriety”, the total and thematic distribution probabilities are 6.60%, 39.76% and 4.90%, 29.52% respectively. In the music of Song lyrics, there are various cultural expressions of “benevolence”, but the main content that is mentioned most frequently is “goodness”. “Kindness” is the exclusive quality of a “gentleman”, and it is also his philosophy of treating others and improving himself. Confucian disciples cultivate themselves with the moral standard of benevolence and righteousness, and move towards a better ideal, while hoping to contribute more to society, to the regime, and to their lord. With the influence of Confucianism on Song music, the idea of “benevolence and righteousness” also had a significant impact on Song music poets, especially the poets of the late Song Dynasty.



(a) Visual Map



(b) Keyword Word Frequency Distribution

**Figure 2:** Cultural Expression Theme Visualization Results

## 5. CONCLUSION

This study utilizes the LDA theme model as an analytical tool to explore the cultural expression of Song lyrics music integrated with Confucianism. A total of 87,035 Song lyrics music integrating Confucianism was screened from the GitHub public dataset using the LDA theme model. When the number of topics in the LDA topic model is taken as 4, it is found that the topic words in Topic 1 include “benevolence”, “propriety” and “harmonious order”. At the same time, it is found that the total distribution probability of the Confucian ideological and cultural theme word "the golden mean" in Song Ci music is 18.50% and 38.54%, respectively, which indicates that under the influence of Confucianism, the neutralization of emotions can be grasped in the creation of Song Ci music, which is reflected in a state of moderation and happiness without lewdness, which is conducive to the cultivation of mind and physical health. Confucianism has been passed down for thousands of years, and the information involved in the study of the fusion of Song lyrics music and Confucianism alone is as vast as a sea of smoke, and the fusion of Confucianism with the content and form of Song lyrics music has created an aesthetic paradigm of perfection, which will provide a new path for the creation of musical works for later generations, and the cultural charm of Confucianism in Song lyrics music still needs to be further explored in the future research.

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