

# GPT-based Language Models meet Emojitaliano: A Preliminary Assessment Test between Automation and Creativity

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## Abstract

**English.** Starting from the crowdsourcing experience of Pinocchio in Emojitaliano [1], the present paper intends to test Chat-GPT's ability to take on the Emojitaliano grammar and dedicated glossary to verify and reapply the Emojitaliano rules in order to produce translations on its own. A test of re-translation of Pinocchio is presented here.

**Italiano.** A partire dall'esperienza in crowdsourcing di Pinocchio in Emojitaliano [1], il presente contributo intende testare la capacità di Chat-GPT di assumere la relativa grammatica e il glossario dedicato per verificare e riapplicare le regole della emojilingua allo scopo di svolgere traduzioni in proprio. Si presenta qui un test di ritraduzione di Pinocchio.

## Keywords

Emojitaliano, LLM, Assessment, Evaluation

## 1. Introduction

Consisting today in over three thousand pictograms and symbols, and regularly updated by Unicode Consortium, the emoji international catalog contains signs for facial expressions (smileys) and for human gestures, portraits of people, plants and the animals, reproductions of food and objects for everyday activities and sports, symbols of travel and places. Whereas the visual content seems to provide an encyclopaedic catalog with a universal status, ideally able to signify language-independent meanings, the interpretation of emojis is, on the contrary, heavily arbitrary, subject to ambiguities and differences due to linguistic and cultural specificities [2].

Some efforts were made to develop an emoji based language that could be shared among different cultural peoples. The first notable project that made an effort of translating a classical novel ("Moby Dick" of Herman

Melville), was the Emoji Dick project<sup>1</sup> by Fred Benenson (2010). Starting from the English version of the novel, each sentence was translated into an emoji version via crowdsourcing. Each of Moby Dick's 6,438 sentences has been translated 3 times by different Amazon Mechanical Turk (MTurk) workers. The resulting emoji sentences were then chosen by voting by another set of workers, and the most popular version of each sentence was selected for inclusion in the book. The outcome is a wonderful but inconsistent translation of the same terms according to the wisdom of the crowd in good sense, but without any shared rules, structure or grammar, leading to the impossibility of recovering the original text or meaning. Another project was the translation of Lewis Carroll's "Alice's Adventures in Wonderland" by Joe Hale<sup>2</sup> (2014). In this case, each word was directly translated into a corresponding emoji. Consistency was thus guaranteed as the same word was translated with the same emoji, introducing a de-facto lexicon. Nonetheless, no grammar structure is developed as the translation follows verbatim the original text and its English-based word order.

In order to counteract the natural polysemy of emojis [3], Emojitaliano<sup>3</sup> was created through a social community on Twitter (#scrittorebrevi #emojitaliano), devoted to the experimental crowdsourcing construction of an international emoji code 'emojilingua' [4, 5]. The aim of the project includes linguistic simplification and the possibility of reproducing a text in emoji that will be com-

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<sup>1</sup><https://www.emojidick.com>

<sup>2</sup><https://www.joehale.info/visual-poetry/wonderland.html>

<sup>3</sup><https://www.treccani.it/vocabolario/emojitaliano>



### 3. GPT-4 meets Emojitaliano

Given the project's goal of establishing an international emoji code, we assumed that LLMs can be a useful tool to speed up translation, as well as to spread the language beyond the currently active community. For this purpose, we chose GPT-4 as our reference model, reported as currently the best general performing model in language tasks [11] also for translation [12], even compared by several users in benchmarks with other open source models<sup>10</sup>. Since we do not have access to the training data of such model, we preliminarily verified that it does not know about Emojitaliano making multiple empirical questions (e.g. "What is Emojitaliano?")<sup>11</sup>. Then, we proceeded to gradually instruct the model using the prompt method [13], by providing pairs of Italian and Emojitaliano translated text or a description of the grammar and lexicon of Emojitaliano.

#### 3.1. Automatic grammar derivation

Our first experiment aimed at observing the capability of the model in acting as a human translator of Emojitaliano, its capability to apply grammar rules, and its ability to use the already known tags by Unicode Consortium to creatively associate Italian words, to memorize and enlarge the lexicon. We developed a prompt where we provided a passage from the first chapter of *Pinocchio in Emojitaliano*, initially without providing grammar and the lexicon, asking it to derive them, instead. Then we asked the model:

1. to derive the syntactic and semantic rules;
2. to translate on its own some sentences by applying the derived rules;
3. to correct and refine the rules by comparing the personal version and the official one.

<sup>8</sup>Developed and updated by Federico Sangati: <https://fede.sangati.me/project/emojitaliano/>

<sup>9</sup>On July 30, 2023

<sup>10</sup><https://chat.lmsys.org/?arena>

<sup>11</sup>The first answer to "What is Emojitaliano?" was generic and incorrect, that is: "Emojitaliano is a term used to describe the use of Italian words and phrases in combination with emojis to create a unique form of communication. It is a type of digital language that blends written words with visual symbols, allowing people to express emotions, thoughts, and ideas in a more dynamic and creative way. Emojitaliano is particularly popular among young people in Italy and has become a common feature of social media and messaging platforms. It has also led to the development of new emojis that reflect Italian culture and traditions, such as the pizza, the espresso, and the gondola. The use of Emojitaliano is not limited to Italy, however, and it has spread to other countries where Italian is spoken or appreciated. It is an interesting example of how digital communication is transforming language and culture, and how people are adapting to new forms of expression in the digital age."

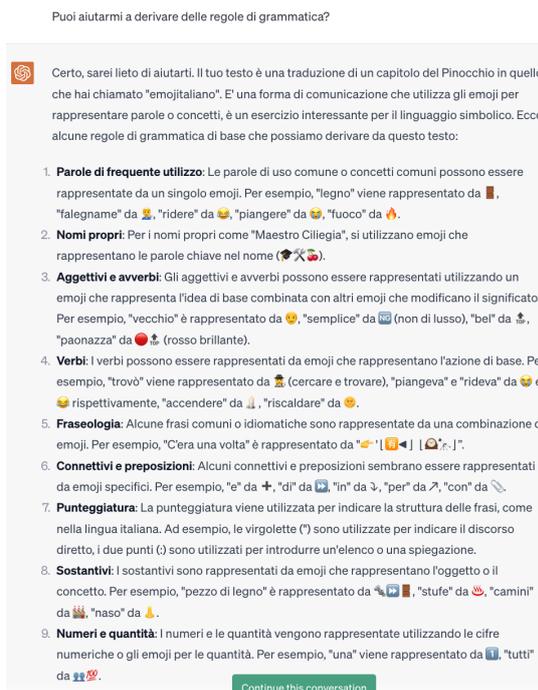


Figure 2: Grammar rules automatically derived by the model. Best seen zoomed in the PDF version.

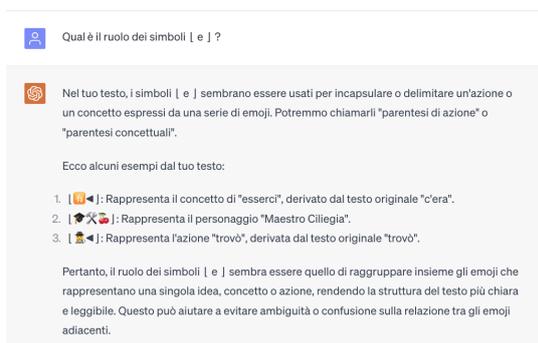


Figure 3: The role of the delimiters, automatically derived by GPT-4. Best seen zoomed in the PDF version.

In Fig. 1, we report the sentences from the first chapter that were given to the model, with the subsequent request to derive the language rules. The output is reported in Fig. 2. The interpretation of conceptual bracket signs in Emojitaliano was then requested, as considered a relevant information missing in the first answer. The result is particularly interesting since a metalinguistic label is assigned by the model, as can be seen in Fig. 3





Figure 7: Further sentences and subsequent derivations of new rules. Best seen zoomed in the PDF version.

player' emoji for 'tirare un colpo'. Although the model is familiar with the rule for the semantic plain translation of figurative language, it does not succeed in applying it, as in 'occhi fuori dal capo', which is translated literally 'eyes going out of the head' instead of rendering the meaning of 'to be shocked' or 'to be upset'.

A relevant issue emerged when Chat-GPT was asked to translate some specific words: for example, 'legno' ('pezzo di legno', 'piece of wood') is translated with the 'fir' ('abete') emoji and, somewhere later, with the 'wooden door' emoji. This is against one of the main Emojitaliano lexical rules which aims at reducing semantic ambiguity. In fact, each word within the same text, should always be translated the same way. Chat-GPT is to be trained accordingly.

We also noticed that grammar and rules mistakes can be corrected by the model upon casually reminding rules in long interactions. The model leaned to progressively forget the rules and, thus, a restart of the session was required after a few sentences. We believe that this is due to the limited window of attention of LLMs and the encoding of emoji that require several tokens for each of them.

## 4. Performance evaluation

According to our preliminary exploration, we established that GPT-4 is able to derive the semantic rules and translate text to Emojitaliano. To evaluate the latter, we per-

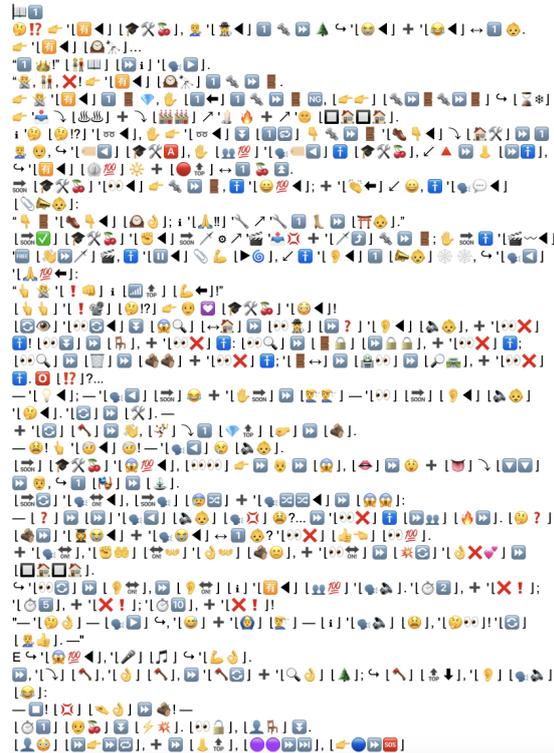


Figure 8: The 1st chapter of Pinocchio translated by the model. Best seen zoomed in the PDF version.

formed a more extensive evaluation by building a dataset of text pairs Italian-Emojitaliano and asking the model for the translation.

We constructed the dataset by considering the first 3 chapters of Pinocchio [14], previously translated in Emojitaliano [1]. The chapters are split respectively in 27, 50, and 45 sentences for a total of 122, ranging from 5 to ~80 Italian words and from 2 to ~70 emojis each. For each sentence, we constructed a pair made of the original Italian text and the relative human translation. Each sentence is given to the model for translation independently from the others.

To perform the evaluation, we constructed a textual prompt where the grammar and the basic rules are carefully explained in Italian, where we include as the training set, the first chapter as given examples of translation. The remaining two chapters are used as the test set. Measuring quantitatively the quality of the translation is more challenging than the typical translation tasks metrics, given the creative use of emojis and their combinations in expressing a meaning. Given the low number of samples, we resorted to human evaluation and the use of GPT-4 as a judge following [15]. For both human and GPT-4 evaluators, we provided the rules of grammar,

Translation by	GPT-4 Evaluation			Human Evaluation		
	Human	GPT-4	Equal	Human	GPT-4	Equal
Preferences	27	51	17	46	36	13
Average Score	7.23	7.80	/	7.34	7.21	/

**Table 1**  
Results of the performance evaluation.

the original text and blindly the translated Emojitaliano from the ground truth and the output of the model. The evaluators were asked to vote for the best translation (i.e. choose the preferred translation) according to relevance, accuracy, creativity, correct use of grammar. In addition to choosing the preferred translation, we also asked the evaluators to provide a quality score from 1 to 10 for each sentence.

Results are reported in the Table 1.

GPT-4 and Human evaluators disagree on their preference of translations. The Human evaluators, generally, tend to prefer the Human translations while GPT-4 the opposite. From the evaluators and GPT-4 feedbacks, we noted that the Human evaluators put more emphasis on the correct structure of the sentences (e.g. the subject verb object rule), while GPT-4 generally reported better scores for creativity and direct matching of the emojis (e.g. emojis that match the words). This is consistent, since the translation in the ground truth was realized in 2017, when most of the modern emojis were still not defined at the time. Due to the absence of a proper matching, many emojis were chosen even if they were distant from the corresponding words. Moreover, GPT-4 has consistently not fully caught the rules of Emojitaliano, leading to less awareness of errors in the sentences structure.

## 5. Conclusions and work in progress

Emojitaliano was born thanks to the free dedication and commitment of an enthusiast devoted Twitter social community, then also of student groups, willing to share the goal of building an emoji-based artificial language model, to be used as a communicative code across language barriers [5, 1]. The effort to adapt to the rules and to join the common glossary, as well as to expand it according to the common rules, was challenging as well as a hard task, but it was the only way to ensure an essential linguistic basis, by giving rise to a language, validated and practiced by a community of ‘speakers’. The intensive crowdsourcing experience made Emojitaliano a unique case among the (actually not many) examples of integral translations in emoji, which are mostly represented by intentionally non-systematic or solipsistic works. The regular expansion of the international emoji set by the Unicode Consortium

constantly extends the range of choice by enriching the emoji-language with ‘emoji-neologisms’, as happens in every living natural language, but the core of the Emojitaliano glossary and grammar provides a settled authoritative translation method. Translating Pinocchio into Emojitaliano today would certainly involve new, and sometimes more relevant, pairings, synonymic pairs that do not exclude the previous ones; but the method remains fixed, because the syntax alone guarantees, through the instrument of translation, mutual understanding. Teaching Emojitaliano to GPT-4 (and the like) does not mean replacing a human translator with a machine, but rather is like having a tool to enhance human work to the maximum: automation ensures the speed, the iconic base of the emoji embeds and guides creativity, therefore setting limits against the arbitrary drift of individual subjective interpretation. Following our design, the year of work spent in the ‘human’ translation of the original 15 chapters of Pinocchio will be matched by a few minutes’ work in the translation of the entire work (35 chapters) by Chat-GPT, and in the translation of other works from any world’s language. Extreme speed is comfortable and convenient, but the results cannot be achieved without training: that is, by learning a “language” and its rules.

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