

# Large Language Models for Few Shot DAIDE Translations

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## 1 Translation

I experimented with GPT-3’s ability to perform DAIDE  $\rightarrow$  English and English  $\rightarrow$  DAIDE translations; I found an impressive translation capability with both 0-shot and few shot learning.

### 1.1 English $\rightarrow$ DAIDE

With the following simple prompt (Figure 1), GPT-3 was able to perform the translations in (Figure 2). The prompt contains the English definitions for three DAIDE keywords, HLD, MTO, and SUP. It also contains a description of how the support to move functionality is defined grammatically. Lastly, it contains two examples of support orders and one example of a convoy order. Surprisingly, this limited information allows the model to not only successfully accomplish few-shot DAIDE generation for SUP and CVY orders, but also 0-shot generation of HLD and support to move orders. GPT-3 is also often able to correctly abbreviate the names of provinces it has not seen in the prompt.

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Here are some words from a language called DAIDE, as well as their english translations:

HLD: hold
MTO: move to
SUP: support to hold

units are defined as (country unit_type province)
a support to move order looks like: (unit) SUP (unit) MTO province

Here are some translation examples from English to DAIDE:

[Russia to England] Can your army in Warsaw support my army in Ukraine?: PRP ((ENG AMY WAR) SUP (RUS
AMY UKR))
[Germany to Austria] Can your fleet on the Baltic Sea support my army in Sweden?: PRP ((AUS FLT BAL) SUP
(GER AMY SWE))
[France to Italy] Can your fleet in the Adriatic Sea convoy my army in Apulia to Trieste?:
PRP ((ITA FLT ADR) CVY (FRA AMY APU) CTO TRI)

Now translate the following from DAIDE to English:
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Figure 1: Prompt used for GPT-3

English Input	GPT-3 Output
[Turkey to Russia] Can your fleet in the Ionian Sea convoy my army in Tunisia to Trieste?	PRP ((RUS FLT ION) CVY (TUR AMY TUN) CTO TRI)
[Italy to Russia] Hi Russia, can your fleet in the Ionian Sea hold?	PRP ((RUS FLT ION) HLD)
[Italy to Turkey] Can your fleet in the Ionian Sea support my army in Naples to move to Trieste?	PRP ((TUR FLT ION) SUP (ITL AMY NAP) MTO TRI)

Figure 2: Few Shot English  $\rightarrow$  DAIDE Translations

## 1.2 DAIDE → English

With a small change in the last line of the prompt, GPT-3 generated English translations of DAIDE orders. I replaced the last line of the prompt with, "Russia is proposing to England the following DAIDE orders. Translate them into English and include the [country to country] tag:". GPT-3 generated the following translations (Figure 3), which are all 0-shot. Note the incorrect translation of "STP NCS" in the second example. Providing the translation "STP NCS: north coast of St. Petersburg" in the prompt solves this problem.

DAIDE Input	GPT-3 Output
PRP ((ENG AMY LVP) HLD) ((ENG FLT LON) MTO NTH) ((ENG FLT EDI) SUP (ENG FLT LON) MTO NTH))	[Russia to England] Can your army in Liverpool hold, your fleet in London move to the North Sea, and your fleet in Edinburgh support your fleet in London to move to the North Sea?
PRP (((ENG FLT BAR) MTO (STP NCS)) ((ENG FLT NWY) SUP (ENG FLT BAR) MTO STP))	[Russia to England] Can your fleet in the Barents Sea move to the North Coast of Sweden and can your fleet in Norway support your fleet in the Barents Sea to move to St. Petersburg?
PRP (SUB ((ENG AMY TUN) CTO SYR VIA (ION EMS)) ((ENG FLT ION) CVY (ENG AMY TUN) CTO SYR) ((ENG FLT EMS) CVY (ENG AMY TUN) CTO SYR))	[Russia to England] I propose that your army in Tunisia move to Syria via the Ionian and Eastern Mediterranean Seas, that your fleet in the Ionian Sea convoy your army to Syria, and that your fleet in the Eastern Mediterranean Sea convoy your army to Syria.

Figure 3: 0-Shot DAIDE → English Translations

## 2 Applications

There are many applications of this translation ability to current SHADE research. For example:

- If a bot is trained that can send and receive DAIDE messages, we can use a language model to have it generate and respond to English messages.
- We can make human interactions with baseline/simple messaging bots more interesting.
- We can use language models for English message annotation. They may also be able to evaluate stances of players and classify positive or negative relations based on messages.

### 2.1 Additional Possible Experiments

GPT-3 has shown to ability to carry out few-shot and 0-shot English → DAIDE translations. Since it appears to be able to infer correct translations directly from the DAIDE grammar, it would be interesting to feed it larger quantities of the grammar (and province abbreviations) and see its 0-shot success. More examples of DAIDE translations would also be useful.

For DAIDE → English, it would be great to have GPT-3 generate different 'tones' of speech. I experimented with having it speak like a WWII general, but with little success. I do believe there is success to be had here, however. Providing actual toned translation examples for DAIDE → English might help.

GPT-3 was sometimes able to respond with "This is not a DAIDE command." when asked to translate text that obviously was not DAIDE text. This could be useful when humans send non-DAIDE related messages to bots, like greetings and general salutations.

## 3 Reproducibility

Please see the OpenAI playground I used. The only hyperparameter I modified was temperature, which I set to 0. I performed minimal prompt engineering and expect that similar open source large language models will produce similarly successful results. For better reproducibility, we should use an open source model in the future.