Long-Term Memory Extension

for Chatbot

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The Algorithm for Human Long-Term Memory

Before the main discussion, let's look at the long-term memory mechanism of the human brain that we imitated. We are not famous neuroscientists, so to put it briefly, information created from various information is stored in the hippocampus as 'short-term memory', and later some of this memory is stored in the cerebral cortex as 'long-term memory'.

Multiple pieces of information are combined into new information in the hippocampus, stored as short-term memory.

Later, parts of this short-term memory are transferred to the cerebral cortex, where they are stored as long-term memories.

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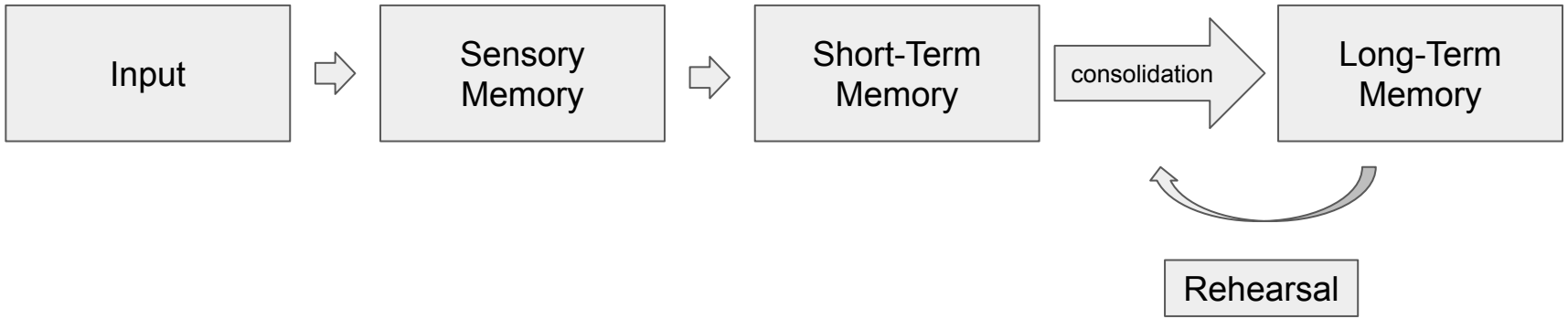

We aim at…

We borrowed part of this method for AI and designed this function (extension). In this method, there are two AI's: an AI (hereinafter main AI) that conducts a conversation with the user, and an AI (hereinafter auxiliary AI) used to remember the conversation.

When a conversation between the bot and the user takes place once, the exchange between the bot and the user in one conversation is stored separately in a file.

At this time, the auxiliary AI analyzes the stored conversation file and stores several topic clusters of the conversation together.

Later, when the auxiliary AI analyzes the user's speech in the conversation, if there is a conversation with topics similar to the current speech in the previous conversation, the main AI is also referred to the corresponding conversation (past conversation with similar topics).

Through this method, semi-permanent memory is stored according to local storage space.

The Key Ideas Are:

1) Store each conversation in a separate file.

2) Analyze each conversation and extract key topics. Cluster similar topics together.

3) When a new user utterance is received, check if there are any past conversation clusters with similar topics.

4) If so, refer the main AI (responsible for the ongoing conversation) to those past conversations as additional context.

5) This allows the AI to retain a kind of long-term memory and have more coherent conversations with the user across multiple turns.

Visualization