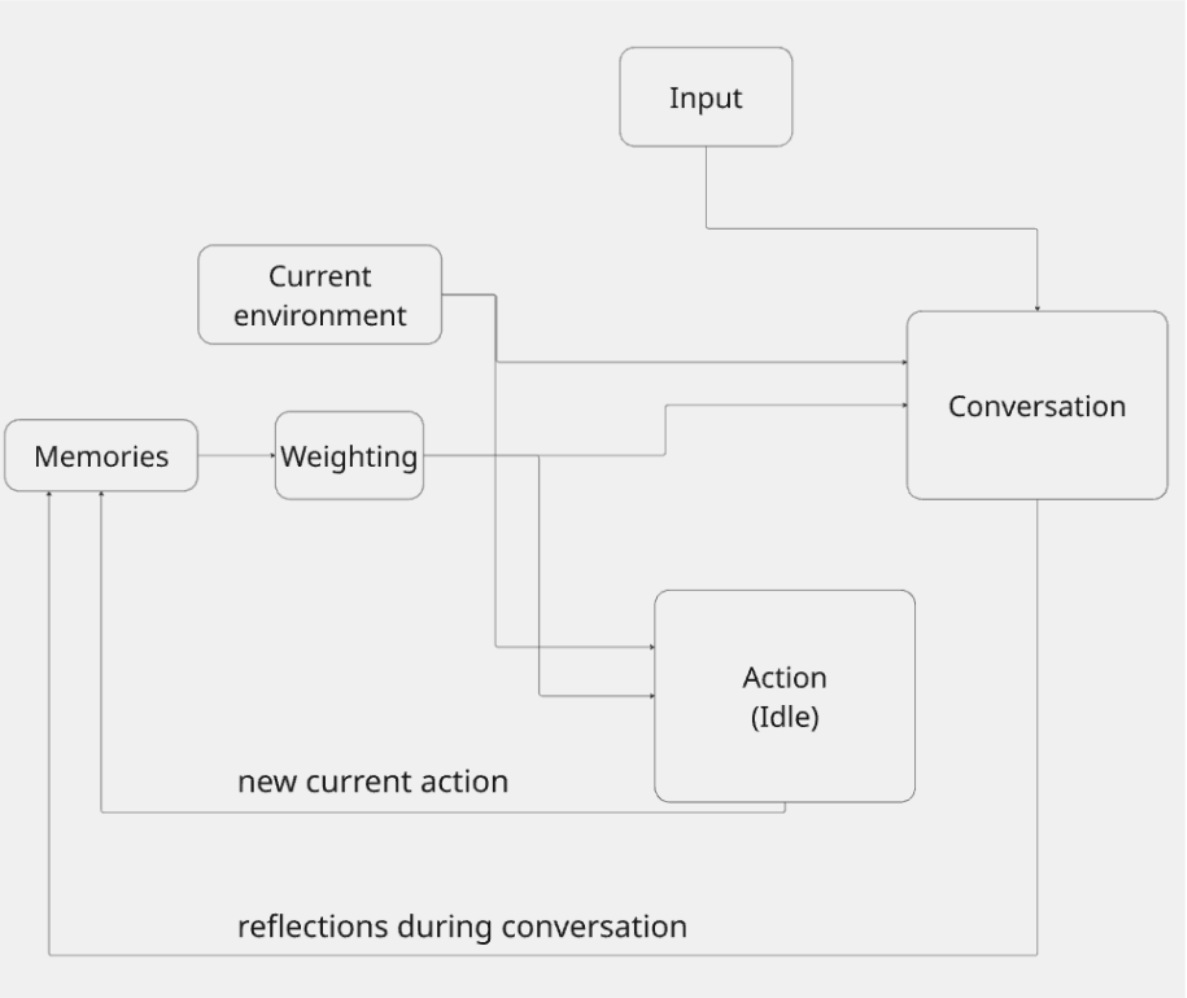
Decision pipeline schematic



Memories: NPC's core memories, obtained memories, needs, stopped actions, and current action are stored in a JSON file.

Weighting: The game applies proper weights to each memory depending on the context.

Current Environment: includes all possible actions and their distances, used for referencing surroundings in conversation – the closer, the more important.

Action: NPC's choose an action based on current memories and environment based on their memories and environment.

New current action: When an NPC starts an action his “current action” segment of his memory is overwritten by this action.

Conversation: Player can start a conversation with an NPC. During the conversation the player inputs a message to which the NPC responds to. The response is based on the NPC's memories, Current environment and player’s input.

Input: A message from the player to an NPC with whom the player is conversing.

Reflections during conversation: NPCs obtain new memories from conversations with a player. They are added to a memory file as obtained memories.

Types of Memories Held by NPCs:

Core Memories: These are things the NPC always knows and considers universally true.

Examples: Your name is Krzysztof. A murder happened in the village a week ago.

Obtained Memories: these are acquired memories, and their validity depends on the sum of weights.

Current Environment: includes all possible actions and their distances, used for referencing surroundings in conversation – the closer, the more important.

Needs: these are needs with a weight from 1 to 3, where at the maximum value it becomes the main priority

Stopped Action: an action from the current environment that was recently interrupted, and you should aim to continue it if nothing more urgent is present

Examples:

Core Memories: your name is Krzysztof, there was a murder in the village a week ago, etc.

Obtained Memories: yesterday you ate lunch at the inn, the blacksmith wasn't home at
midnight

Current Environment: drink from the well, eat at the tavern

Stopped Action: an action from the current environment
Obtained memories have 3 weight categories from 0 to 10, with a maximum total of 30.

<u>These categories are:</u>

- **Recency** – how recently the memory was formed
- **Importance** – how significant the memory seems without context
- **Relevance** – how important this information is when connected to other memories

Recency will be calculated by a script that, for example, initially gives the maximum value (10) and then multiplies the value by 0.95 every in-game hour, causing it to gradually decrease.

Importance will be evaluated by a model receiving the memories as input to assess them.

Relevance will also be evaluated by a model, but aside from the memory being assessed, it will also receive all memories possessed by the NPC to evaluate its connection with others. Additionally, if an old memory connects with a new one, it might be edited. For example, if a memory is created indicating that a neighbor was sneaking around the church yesterday, even though it seems suspicious and should score relatively high in importance, it wouldn't score very high in relevance unless further connections arise. However, if another memory later indicates that something was stolen from the church, the relevance of both the new and the old memories would increase due to the established connection.

When making idle decisions, the model only receives the total weight sum, not each category separately. High-weight memories should be considered by the model when making decisions.