

# SimuVerse Project Update

Roman Slack

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## Introduction

The SimuVerse project has reached a stage where the current code structure is limiting the integration of new features. To address this, I am reworking the foundation to improve scalability and flexibility for future development.

## New Foundation Overview

Each agent will be represented by a Language Learning Model (LLM) connected to a sprite and a game tag. The agent will interact with the environment by selecting from four distinct tools. Agents will choose tools by adding prefixes to their responses, such as:

(MOVE) I want to move to the park.

A separate LLM will act as an interpreter, analyzing each agent's response in each iteration of the simulation. This interpreter will output structured data in the following format:

[ "agent\_1" (agent identifier), "MOVE" (tool identifier), "park" (context of action) ]

This data will be passed through a checker, which identifies the tool and routes the agent's identifier and action context to the appropriate tool. For instance, if the agent selects the *Converse* tool, the agent will engage in up to 10 back-and-forth interactions before being removed from the conversation. The agent will then be prompted with:

*"You have been in conversation too long and have been removed from the conversation. Please select one of the four tools to use next."*

Agents can also exit conversations early by sending a signal such as (LEAVE CONVERSATION). The checker will recognize this signal and remove the agent from the conversation. Note that this system is prone to errors and requires further research and development.

# Core Tools

The four core tools available to agents are as follows:

1. **Converse:**

Up to three agents within a predefined range can engage in a linear conversation, responding to each other in sequence.

- *Inputs:* Other agents' responses.
- *Outputs:* Responses to other agents.

2. **Move:**

The agent can move to predefined locations such as **(home)**, **(park)**, or **(cafe)**.

- *Output:* Confirmation of movement to the selected location, along with a list of agents currently at that location.

3. **Scan:** (Credit to Oliver)

Provides the distance to all environmental objects and agents within a certain range, along with their coordinates.

- *Output:* Coordinates of objects and agents in range.

4. **Call:**

Agents can invite other agents to meet at a specific location to converse.

# Reset Mechanism

If an agent fails to choose one of the four tools on the first prompt, it will be re-prompted with the last input received (or the intro prompt if it is the first iteration). If the agent again fails to output a valid response, the reset mechanism will be triggered. The agent will be returned to its starting location and re-prompted with the introductory scenario. This mechanism ensures that agents do not go off-track after a large number of iterations.

# Future Development

Building on this revised foundation, a memory system can be implemented. This system will track each agent's past decisions and conversations. By using Retrieval-Augmented Generation (RAG), agents will be able to reference their memory to inform future interactions and decision-making.