# SimuVerse

## A Scalable Multi-Agent AI Environment

Roman Slack - 10/27/24

# Objectives

- Build a scalable, multi-agent AI environment with a game-engine-based visualization.
- Fully open-source
- Compatible with both API based models and locally running models
- Compatible with external compute power
- Easy to visualize and aesthetically pleasing
- Research ready

# Inspiration

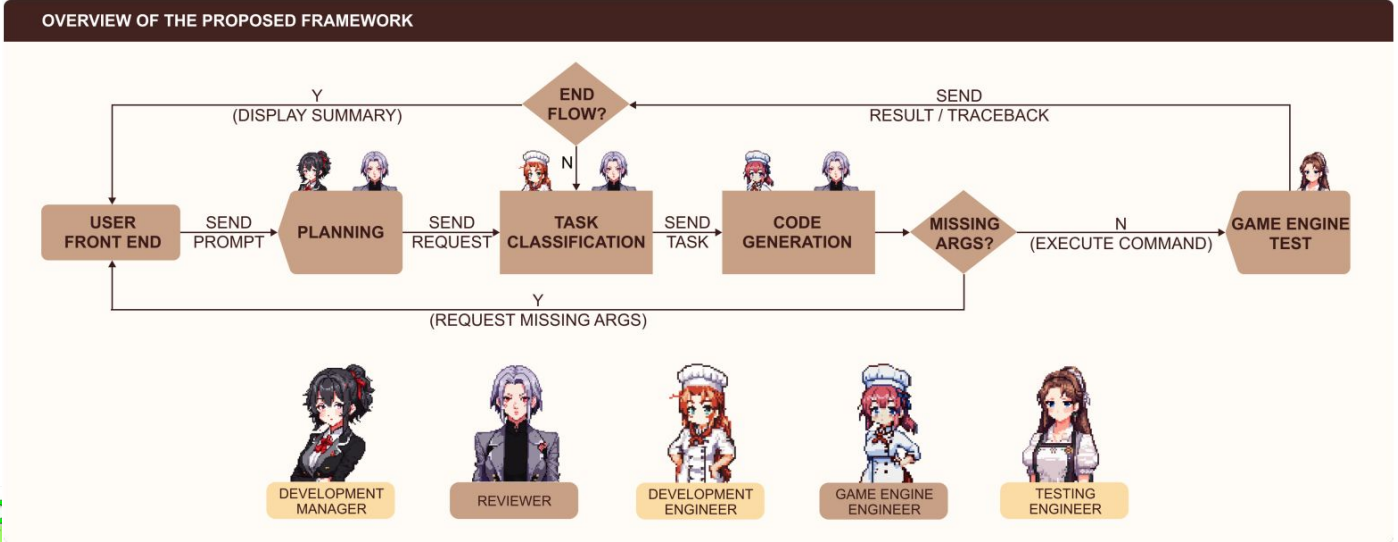
Previous research in the field:

- **Game GPT**: Multi-agent Collaborative Framework for Game Development
- **ChatDev**: Communicative Agents for Software Development :
- **MetaGPT**: Software Company as Multi-Agent System
- **Neural MMO:** A Massively Multiagent Game Environment for Training and Evaluating Intelligent Agents:

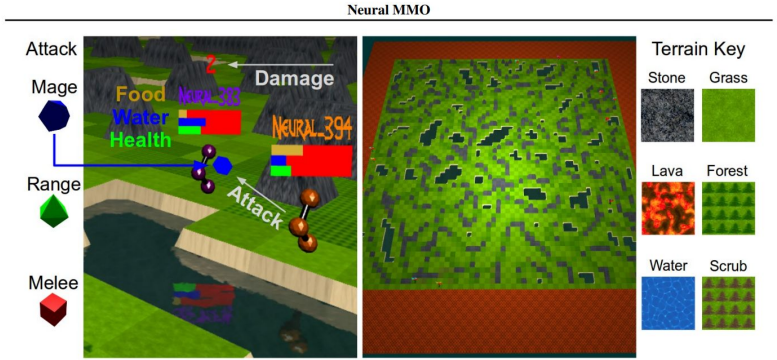
GameGPT - Dake Chen Et al.

ChatDev, Chen Qian Et al.

Neural MMO, Joseph Suarez Et al.

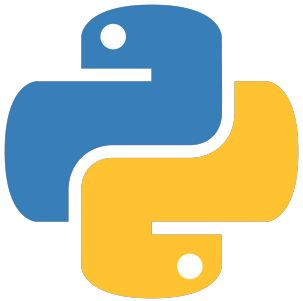



Source: [Park et al. 2023]

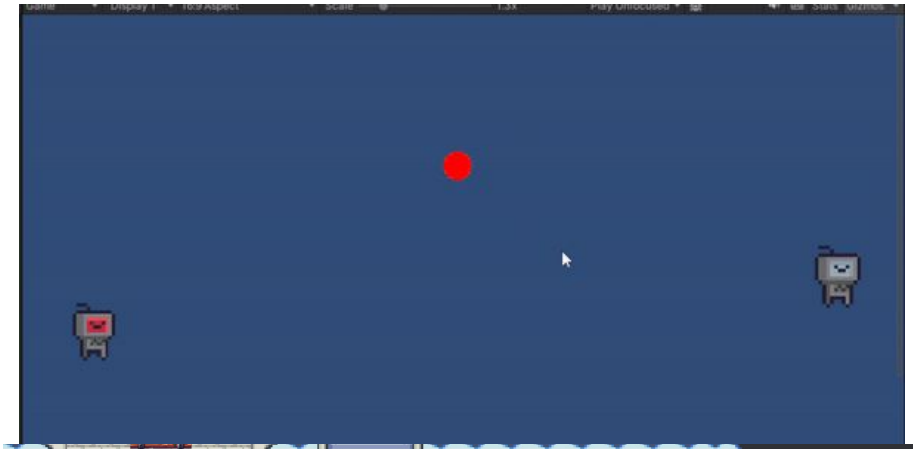


# Technical Approach

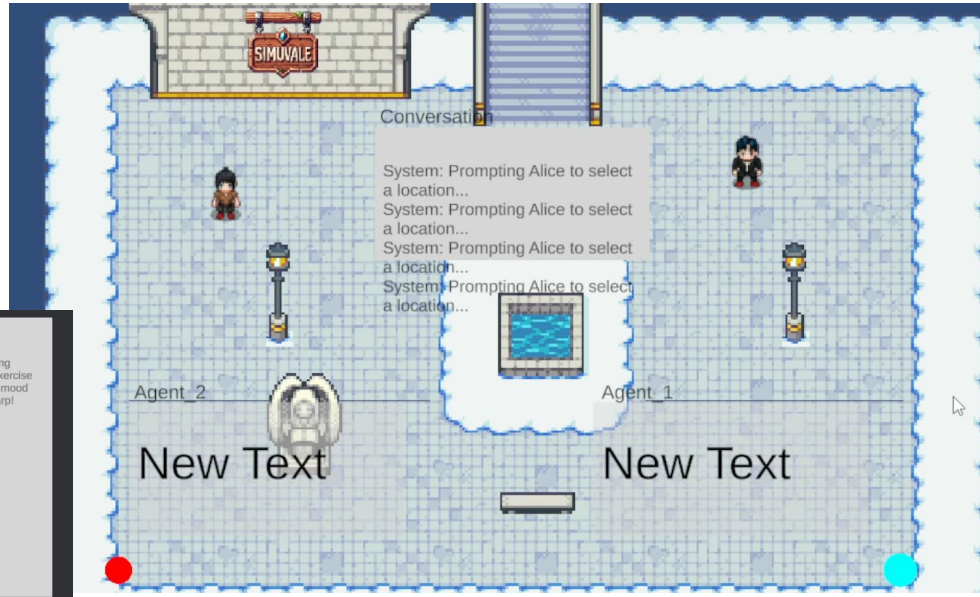
- Utilizing existing LLM's such as ChatGPT 4.0 and Llama 3.1
- Visualizing results and realtime data in Unity (C#)
- Constructing technical framework using Python
- Utilizing external or internal compute power and optimizing for local real time speeds.




# Progress

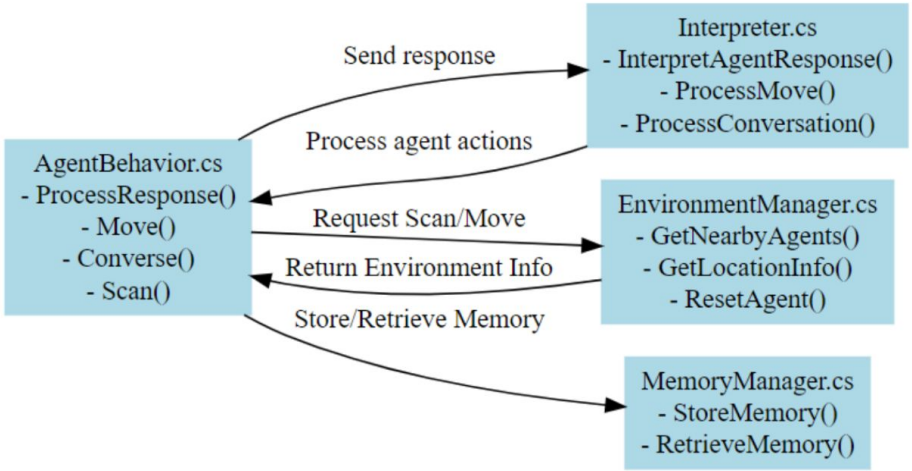


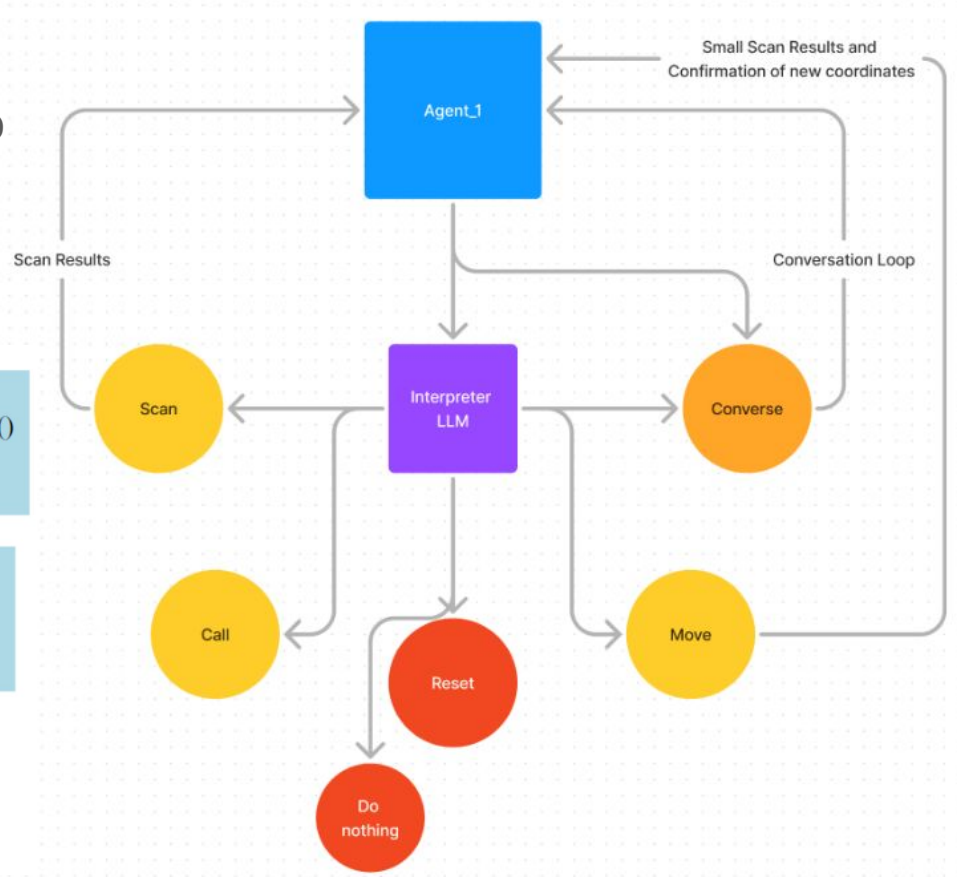

SIMUVALE
Agent_1
I want to move to the gym.
I chose the gym because I'm feeling energetic and want to get some exercise in. It'll be a great way to boost my mood and keep my physical abilities sharp!
Interpreter Output
["Agent_1", MOVE, GYM]


SIMUVALE
Conversation
System: Prompting Alice to select a location...
System: Prompting Alice to select a location...
System: Prompting Alice to select a location...
System: Prompting Alice to select a location...
Agent_2
Agent_1
New Text
New Text

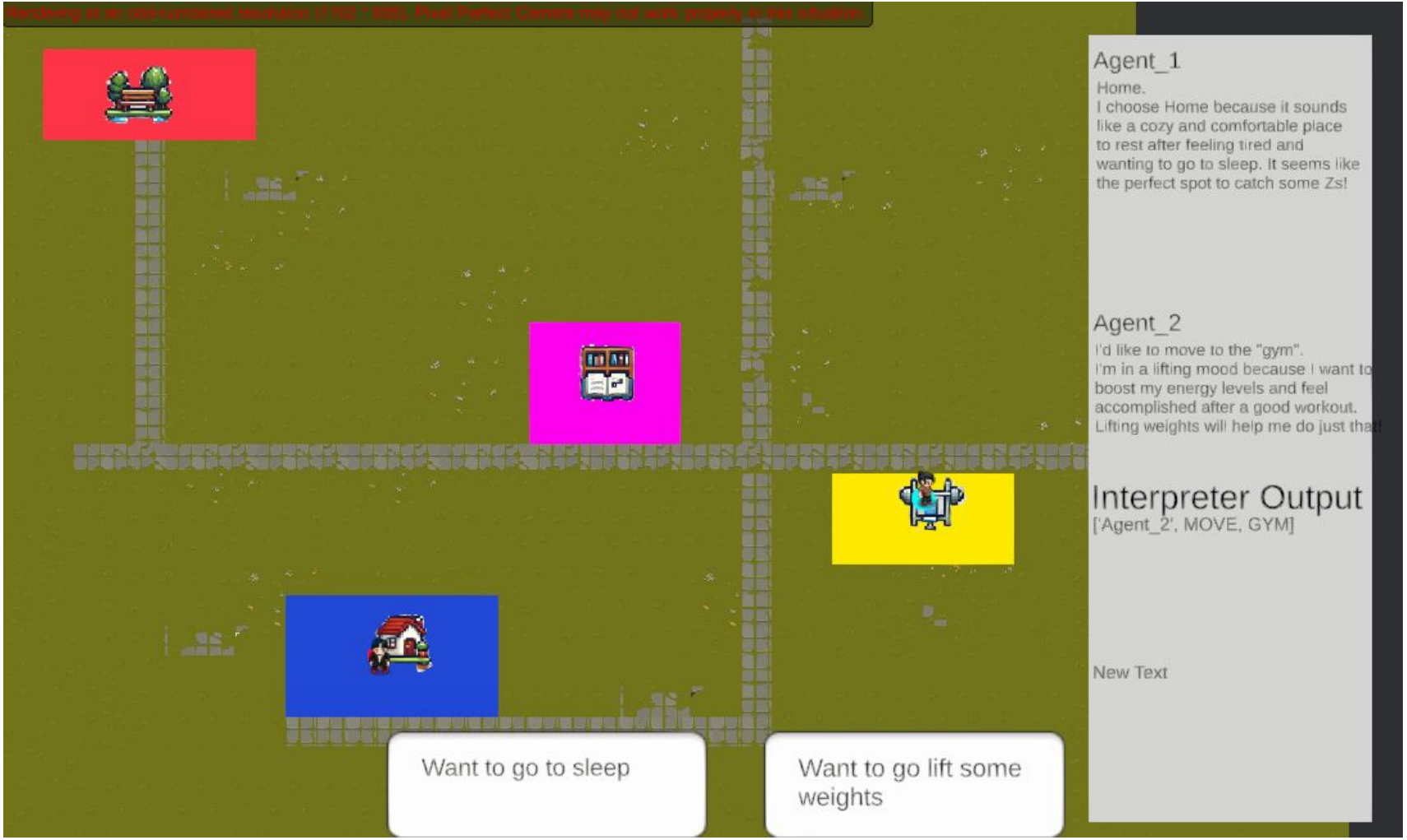
# Progress

After a proof of concept, we delved into mapping out how the foundation would work, and landed on the below foundation.




Agent_1
New Text
Agent_2
New Text
Interpreter Output
New Text
New Text
Want to go to sleep
Want to go lift some weights


Rendering at an odd-numbered resolution (1152 x 692). Pixel Perfect Camera may not work properly in this situation.
Agent_1
Home.
I choose Home because it sounds like a cozy and comfortable place to rest after feeling tired and wanting to go to sleep. It seems like the perfect spot to catch some Zs!
Agent_2
I'd like to move to the "gym".
I'm in a lifting mood because I want to boost my energy levels and feel accomplished after a good workout. Lifting weights will help me do just that!
Interpreter Output
['Agent_2', MOVE, GYM]
New Text
Want to go to sleep
Want to go lift some weights

# Future

Currently the team is working on different aspects of the project, with the goal of combining all the different aspects into the final environment.

For example:

- **Memory** - A robust system to give the agents short term memory during the simulation using vector databases and small LLMs.
- **Personality** - A way to test how models react to different personalities and possible human-like behavior.
- **Game Environment** - Make the environment optimized for many agents and look better
- **More Tools** - Add tools such as converse and scan. (These are almost done)

SimuVerse_V1 Public

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# SimuVerse

**SimuVerse** is a multi-agent simulation environment powered by large language models (LLMs) integrated into Unity. The project focuses on creating interactive agents that use LLMs to perform tasks such as movement, communication, and tool-based interactions within a 2D grid environment. Each agent can communicate with other agents, interpret responses, and perform various actions such as pathfinding and interacting with tools like `MOVE`.

The goal of SimuVerse is to create a scalable, research-friendly platform that simulates realistic agent behavior with advanced memory handling mechanisms for long-term interactions.

## About

Repository for the RIT AI SimuVerse Project, led by Roman Slack

- Readme
- MIT license
- Activity
- 0 stars
- 1 watching
- 0 forks

## Releases

No releases published
Create a new release

## Packages

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## Languages

- C# 100.0%

## Suggested workflows

Based on your tech stack

.NET — Configure

# Thank You

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