

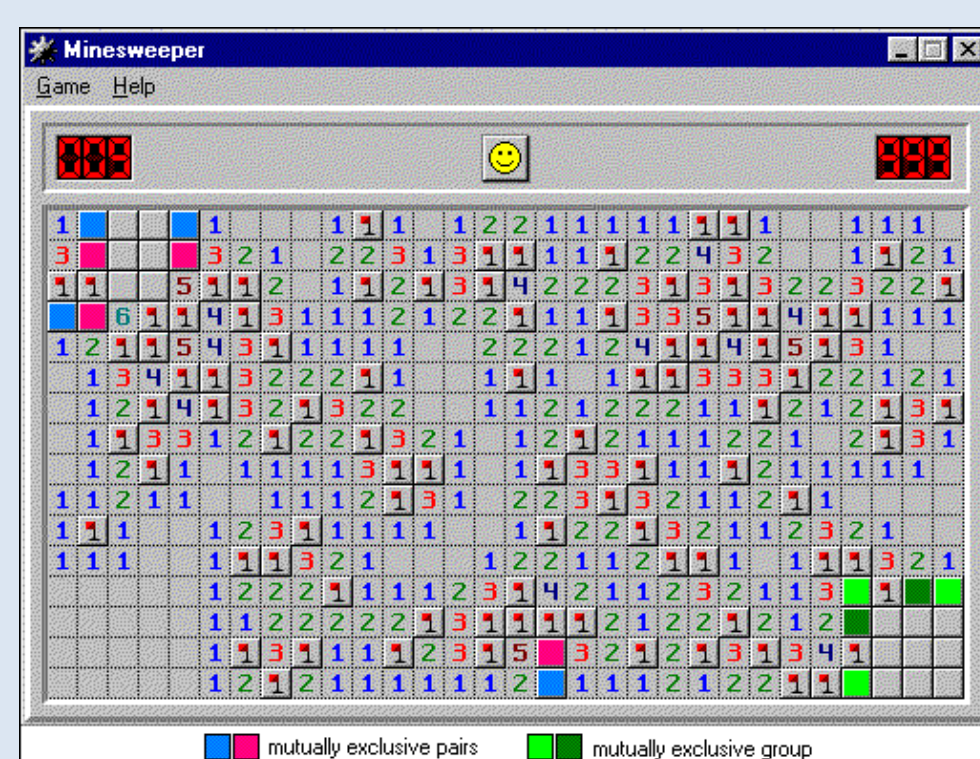
## Abstract

The purpose of this project is to design and implement a system of dynamically generating narrative as a possible alternative to the story tree model commonly used in the video game industry.

## Motivation

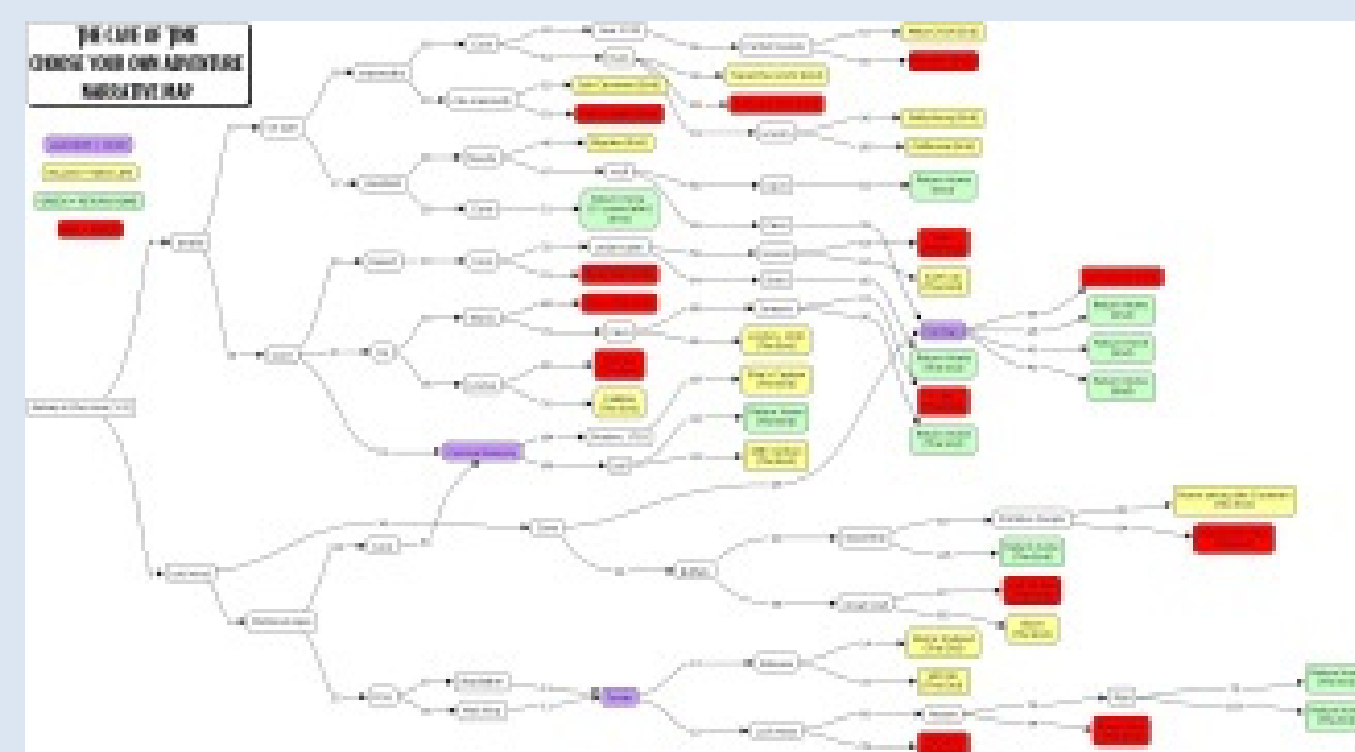
**“A game that’s different every time you play!”**

Video game developers often express the desire to create games that offer a different experience on each play through, increasing the product’s replay value. In the past when games were relatively simple, this was an easy task. Each time one loaded up Minesweeper or Snake they got a different game with the same rules and principles.



above: a still from variable game Minesweeper

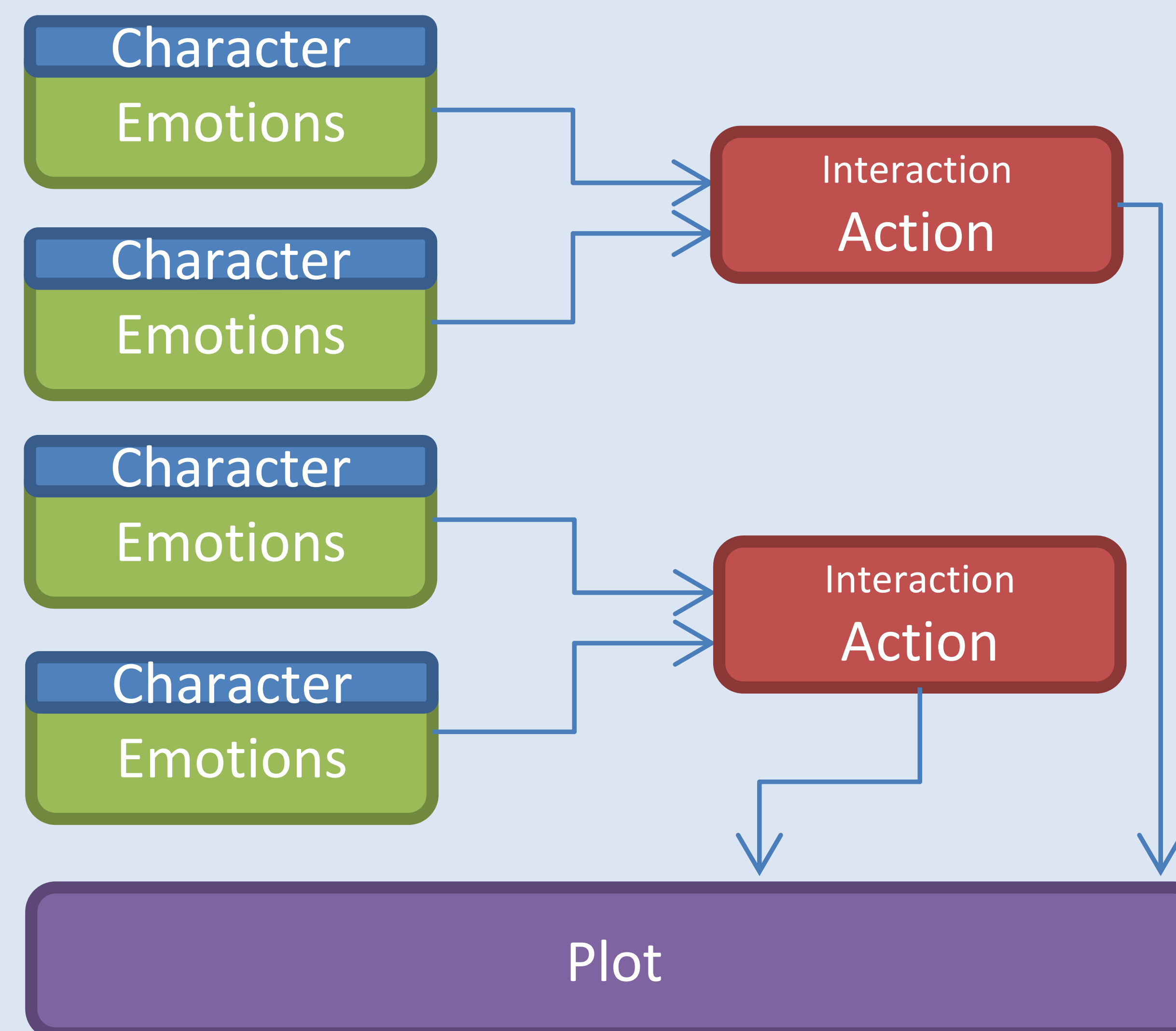
Now that video games are story based, this has gotten increasingly difficult to do. The common solution has been crafting multiple branching stories and allowing the actions of the players to alter the path of the prewritten story. This has proved to be prohibitively expensive, with companies paying for the development of multiple stories, levels, and paths in place of just one. Many developers have backed away from attempting a varied play experience altogether, just for cost reasons.



above: a story tree from cs.wisc.edu

**Solution:** Generate stories in real time by making stories character based. Define character behaviors and variable emotions (which will serve as motivation for actions). Introduce randomized elements (character locations, items, etc.) and allow the actions of the characters to drive the story.

## Model



Action and interaction choices are determined by the emotional states of characters along with a very slight element of chance. Actions are assigned an “Action Importance Value”. Based on principles of screenwriting and three act structure, actions of a certain value are picked as plot points. After an inciting incident, two major plot points, and a “falling action” beat of lower action importance, the story is brought to a close.

## Writing by Tone

config file

Defines:  
-Characters (randomized or predefined)  
-Emotions driving scene  
-Action files to be included

action file

Defines:  
- What emotions cause/are affected by the action  
- Misc. in game action effects, like ending interactions, killing, etc.  
-Animation to play

As the narrative is now generated in real time, the story designer shouldn’t (and in fact can’t) concern him or herself with specifics. Instead, the designer determines what type of story is told in broad strokes through creation of the “story web” – selection of the characters, emotions, actions, and win/lose states that will define the generated plot.

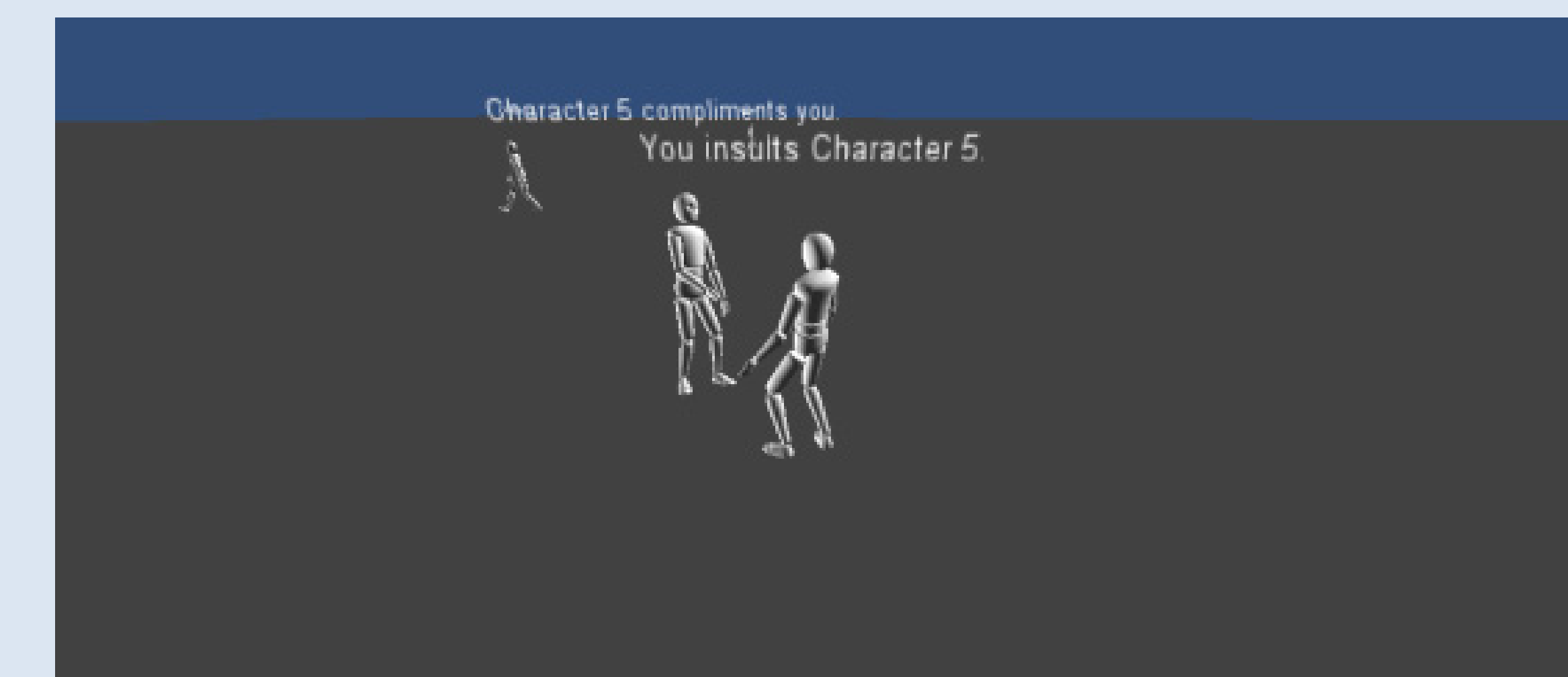
## Results (Text Simulation)

```

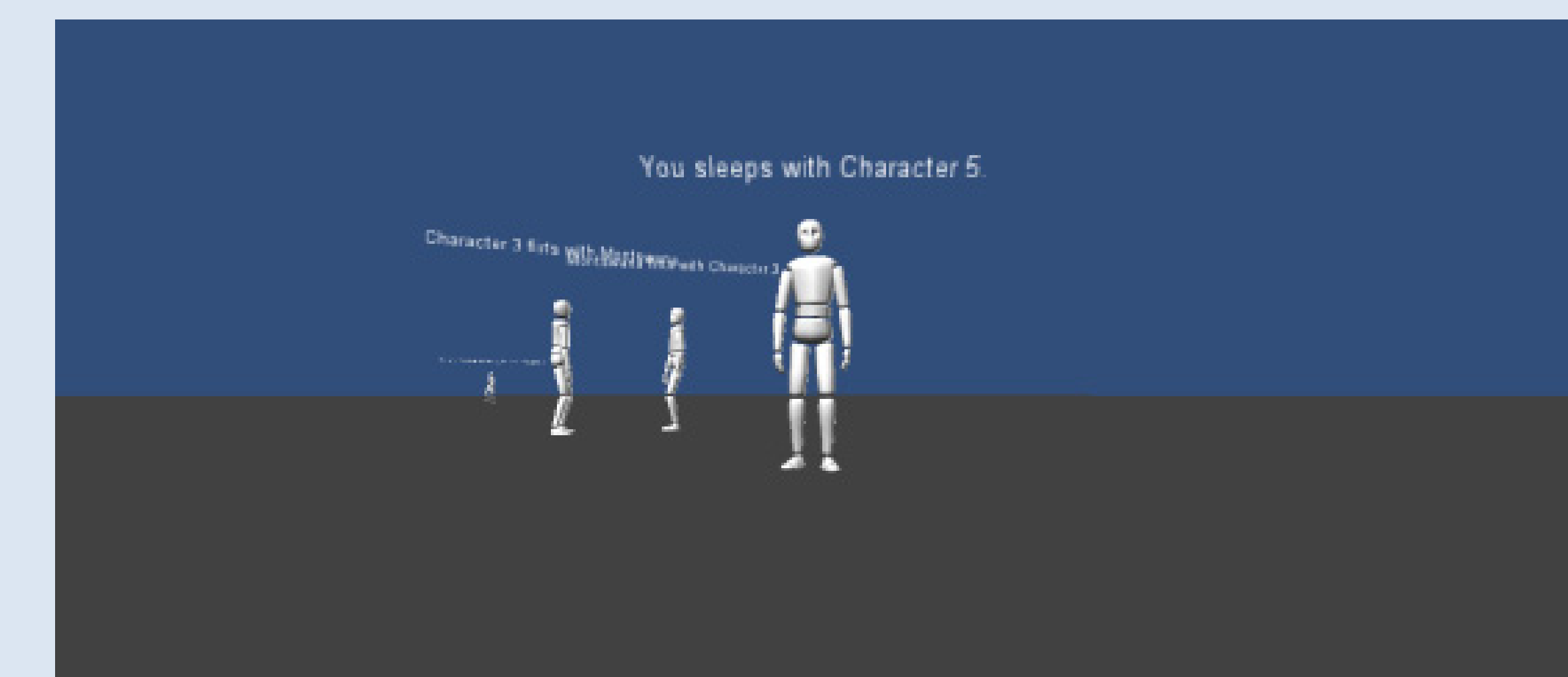
C:\WINDOWS\system32\cmd.exe
Commencing Setup. Reading testworld.txt
Simulation Start
Bob engages Character 5
Bob compliments Character 5.
Character 5 compliments Bob.
Character 5 compliments Character 5.
Character 5 compliments Bob.
Bob storms off, ending the conversation with Character 5.
Character 4 murders Character 5.
Bob engages Character 4
Bob storms off, ending the conversation with Character 4.
Character 4 engages Bob
Character 4 murders Bob.
Press any key to continue . . .
    
```

Text based simulator experiment with model of dynamic story generation. This version suppressed action information below a certain level of importance. “Bob” is the main character, so we are only interested in him and his contacts.

## Results (Interactive Game)



Functional prototype written up in Unity allows the player to control a character and select any action from those listed in the game’s “story web” when interacting with an NPC (non-player character).



NPCs continue to walk around and interact with each other, shifting each other’s emotional states in such a way that they might indirectly impact the player’s story. For example: if Character 2 gets in a fight with Character 3 and enrages them, then Character 3 storms off and runs into the player controlled character, their interaction is likely to be an unpleasant one. Therefore, Character 2 has changed the player’s story without ever interacting with them directly.