

The University of Western Ontario

Immersion Through Believability: Using Realistic Character Behaviours to Enhance Gameplay Experiences

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Outline

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Introduction

- Immersion can be of great importance to the success of a video game
- It can be a clear indication of the player's:
 - Interest
 - Engagement
 - Focus
 - Enjoyment
 - Attention
- As a result, immersion is a desirable goal to strive for in a game

Introduction

- Many conditions may help support or maintain an immersive experience, including
 - Satisfaction of player expectations in the game world
 - A non-trivial influence of the player on the game world
 - Consistency in the game world
- In other words, a game must behave in a realistic and believable fashion, or else it will not properly immerse the player or keep them that way

Introduction

- In particular, believable and realistic behaviour from non player characters can support or improve player immersion
- The requirements for this are steep:
 - Personality, emotion, self motivation, social relationships, consistency, the ability to change, and the ability to maintain an “illusion of life”, through having goals, reacting and responding to external stimuli, and so on
- Delivering this in practice is difficult ...

Our Approach

- In our work, we take an emergent and dynamic approach to character behaviour
- This is desirable for several reasons:
 - The interactions of relatively simple building blocks can give rise to interesting, complex, and difficult to predict dynamic behaviour
 - The system is more flexible and responsive to the current state of the game
 - It avoids exhaustive coding or scripting of behaviours for every possible situation, which is incredibly difficult, time consuming and expensive

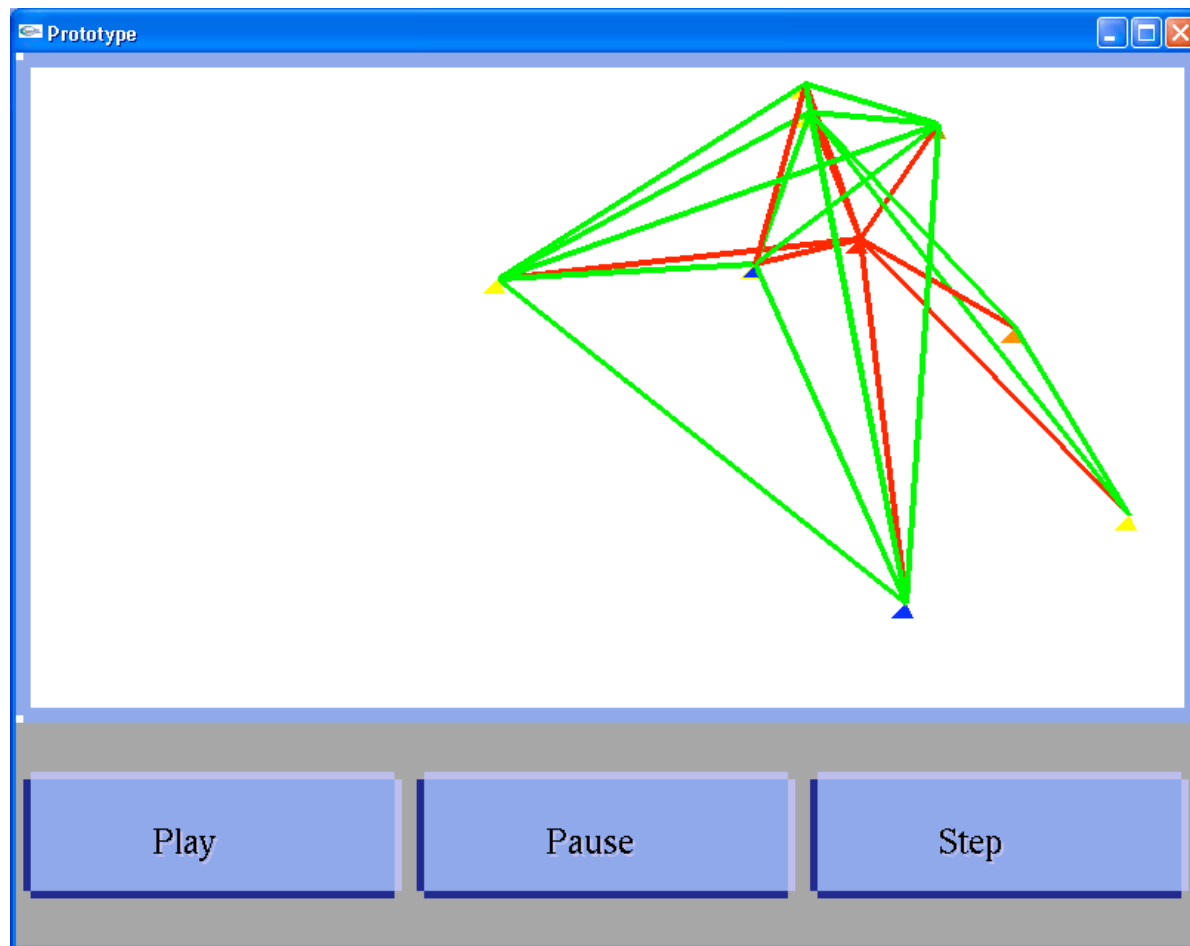
Our Approach

- To provide believable behaviour we have developed a series of prototype systems with increasing power and expressive capabilities
- This does come at a cost, but continuing research is aimed at minimizing these costs without sacrificing believability
- On-going research is extending our work further, allowing us to explore new and interesting avenues of research and immersive gameplay

Work to Date: First Generation

- The first generation system (Bailey) was based purely on emergence
 - Provided characters with simple personality, emotions, and social ties
 - Emergence allowed for interesting behaviours and situations to occur
 - Characters were hard coded and models were perhaps overly simple, however
- This still achieved good results in simulations, and provided foundations for further work ...

Work to Date: First Generation



Screenshot of First Generation Prototype

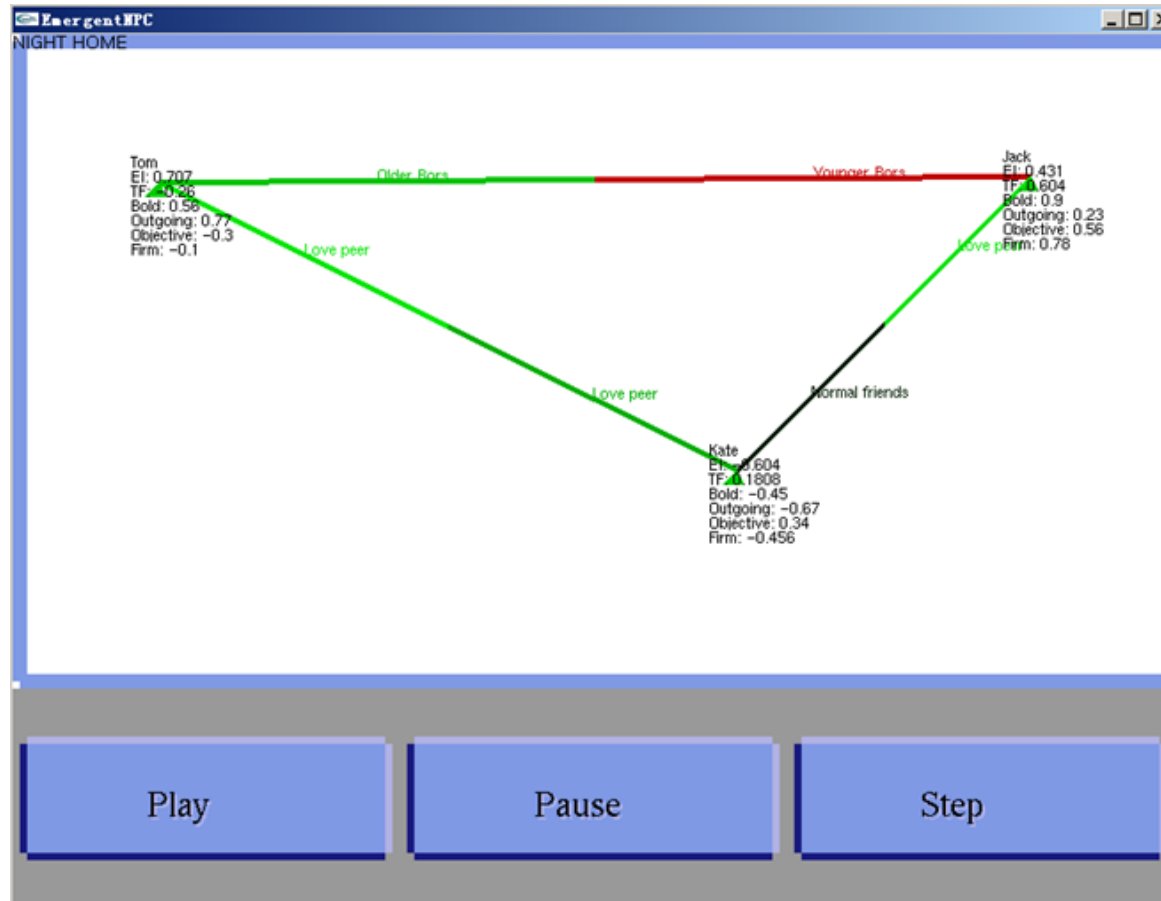
Work to Date: First Generation

- There were limitations to this system ...
 - Characters were too reactive, emotional, and instinctual, and needed more higher-order reasoning, logic, and planned goal-oriented behaviour
 - Performance was at times an issue, especially with a large number of characters and complex modeling
 - It would be difficult for characters to adhere to story since they could only react to the world around them

Work to Date: Second Generation

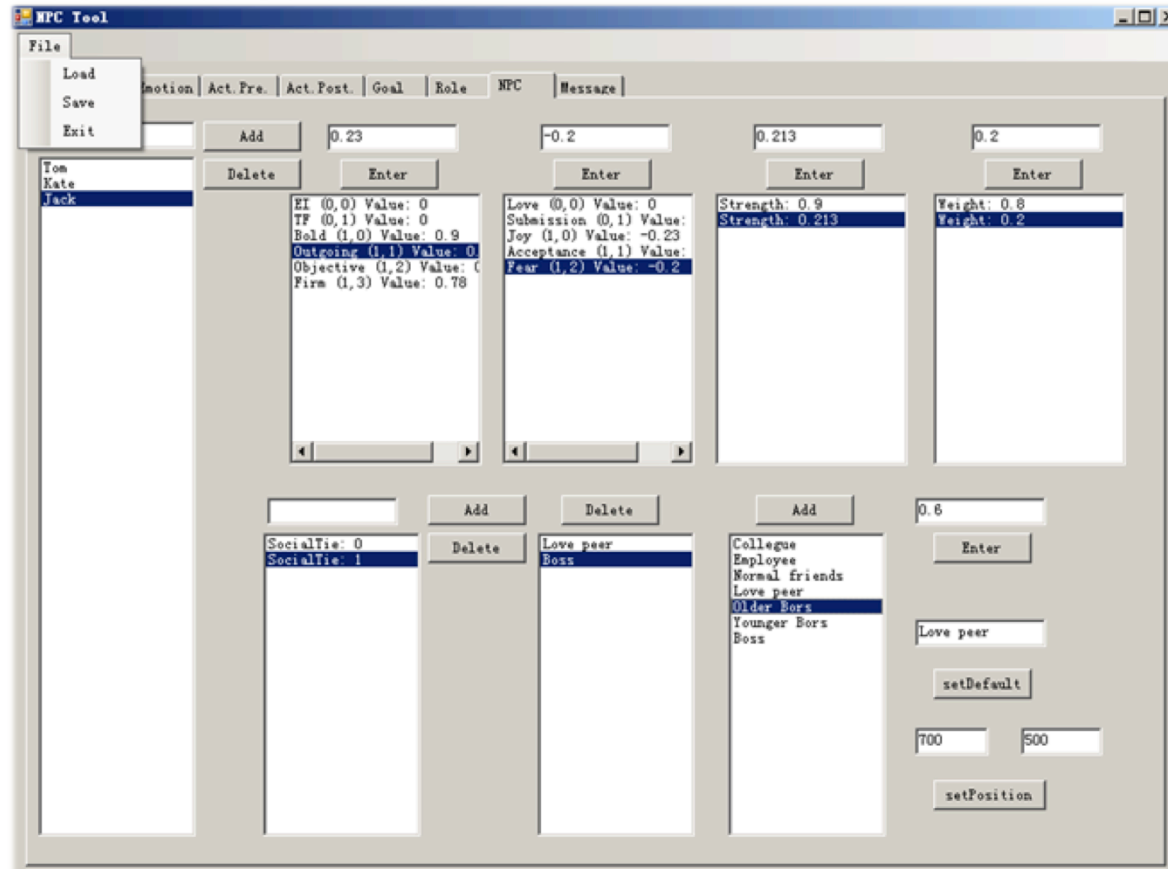
- Several improvements were made in our second generation system (You):
 - Characters now also had goals and roles
 - Everything is now data driven, so it is easier to define and refine characters
 - Furthermore, the character models are flexible and extensible, with several models supported at once
 - Behaviour of characters in this prototype is even better and more interesting than in the first prototype

Work to Date: Second Generation



Screenshot of Second Generation Prototype

Work to Date: Second Generation



Screenshot of Character Modeling Tools

Work to Date: Second Generation

- While an improvement, there were still limitations to this approach
 - While this system supported goals, planning was still fairly limited and needed more work
 - Performance was still a potential issue, despite optimizations made during development
 - Story interactions were still problematic

Work to Date: Third Generation

- With lessons learned from earlier systems, a new system was developed (Acton):
 - Includes support for utility based planning and action selection that is compatible with emergent principles
 - This is also based on psychosocial concepts, with extensions to include a BDI model, role theory, coping, an active emotional memory, and other elements
 - Support for a to-be-developed story manager to maintain story continuity and avoid disruptions to critical plot elements

Work to Date: Third Generation

- This third generation system also includes performance optimizations to improve efficiency and promote scalability (Rankin):
 - Advanced scheduling and dispatching of character execution
 - Capability scaling and adjustment
 - Dynamic tuning of performance elements based on need, importance, and impact on story and gameplay

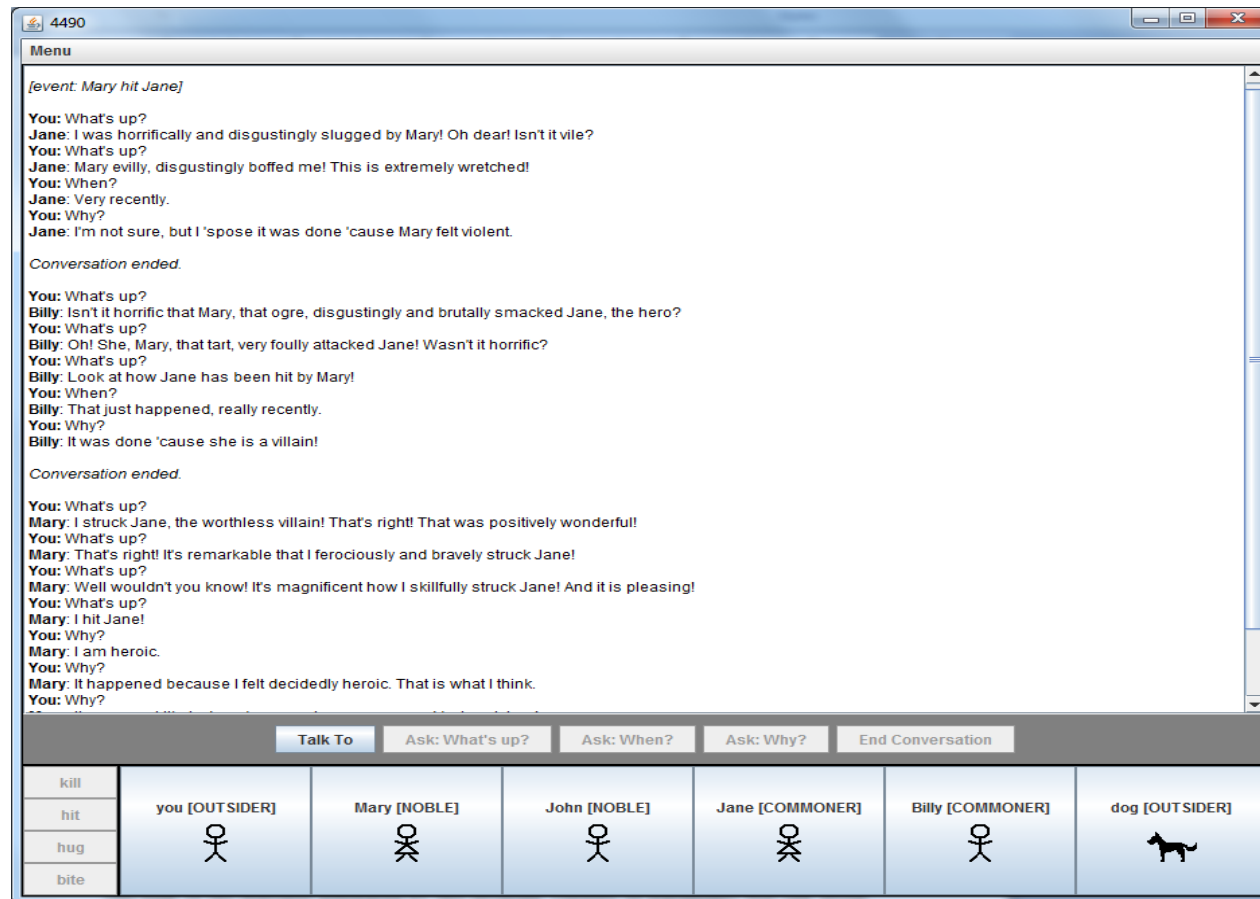
Work to Date: Third Generation

- Results to date with this system have been quite promising
 - Re-enacting various dramatic pieces (Shakespeare, for example), and producing new scenarios
 - Performance is far better than earlier prototype systems, with potential for further improvements in the future
- Still, there is much to do ...

Work in Progress

- One avenue of research currently being explored is dialogue synthesis for believable psychosocial characters
 - A great deal of meaningful character interaction occurs within dialogue between characters
 - Consequently, we need dialogue that is also based on personality, emotion, and social relationships
 - This dialogue must be constructed dynamically at run-time based on what is actually going on in the game

Work in Progress



Screenshot of Dialogue Synthesis Prototype

Work in Progress

- Other on-going work is exploring embedding our character systems into an existing game engine
 - In our case, we are using the latest Unreal Development Kit (UDK) with characters programmed using UnrealScript and Kismet
 - We are also building a residential level for hosting a house party to create a variety of social simulations and open up a variety of new gameplay experiences made possible through social interactions

Work in Progress



Screenshot of UDK Residential Environment

Conclusions and Future Work

- We have made considerable progress towards the creation of believable characters for more immersive games
- There is still much to do, with many open research problems to explore
 - Completing our on-going work
 - User studies and assessment of our work, to assess both believability of characters and changes to immersion that result