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

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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
  - Focus
  - 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 …
• 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.