

Residual Memory for Background Characters in Complex Environments

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Online Video: www.bit.ly/Z4WWXg

This dissertation aims to explore methods for increasing the believability of background characters in open-world games by giving them the ability to react to situations in a much more natural manner than current approaches. Background characters play a vital role in making a game's environment feel cohesive and believable, but they generally follow scripted, repetitive motions until influenced by the actions of a player. This project presents a generalised memory model that enables characters to remember and recall the state of the world around them, either in the form of larger scale events or as smaller scale interactions, and react to any changes as they occur. Over time, memories which aren't reinforced become fuzzy, may be remembered incorrectly, and are eventually forgotten.

The model is tested by developing a small prototype environment within the Unity game engine, and observing how the characters within this environment behaved. A goal-driven system allows characters to access their memories to determine the best methods to achieve their goals, and a fallback system allows characters to attempt to resolve their own problems if they find themselves unable to recall the memories they need. Through consideration of the memories they have, a character can determine how best to gain the memories they need, for example by asking someone they know to share their relevant memories. Players can even interact with the characters, to help or hinder them.

The implementation showcases a model with significant potential, where characters naturally develop habits and make decisions with genuine purpose, making them much more interesting to observe and encounter within the environment.