Title: Believable Decision Making in Large Scale Open World Games for Ambient Characters

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Abstract: Large scale open worlds for computer games are inhabited by populations of Non-Player Characters (NPC). Believability of these NPCs is key in presenting immersive gameplay to the player. Managing complexity of NPC behaviors is a fundamental game development problem. This thesis is focused on increasing believability of NPCs' behaviors by providing an enhanced language for specifying action selection for these characters. The language is based on the Behavior Tree paradigm combined with object-oriented programming. We introduce our language's mechanisms that enable a developer to create complex, yet maintainable behaviors for individual NPCs. Second, we introduce our mechanism called Intelligent Environment aimed at maintaining a believable game environment able to adapt to player's actions and NPC's behaviors. Thirdly, we present our Smart construct concept which provides NPCs with context relevant behaviors from dedicated behavior containers to employ them when present at locations, using objects, or engaging in the game's quests. Fourthly, we present our semantic network to allow exploration of relations between objects, NPCs and in-game locations by means of predicate based queries. We integrated our architecture into the Kingdom Come: Deliverance computer developed by Warhorse Studios to evaluate the feasibility our approach in a real-life production of a big budget open world computer game.