Exploring the Integration of BDI Agents in Games and Virtual Environments

Presentation Outline

1. Introduction
    - Motivation: Traditional game AI lacks realism and human-like behavior, reducing immersion;
    - Solution: Belief-Desire-Intention (BDI) framework offers a human-like decision-making model;
    - Relevance: BDI agents improve strategic depth and adaptability in various game genres.
2. BDI Framework Overview
    - Based on Bratman's theory of human practical reasoning
    - Talk about the core components (Belief/Desire/Intentions)
    - Emphasise benefits
        i. Context-aware, autonomous behavior
        ii. Computational efficiency
        iii. Improved player-agent interaction realism
3. Adamatti - ViP-Jogoman (Turn-based RPG) : Case Study
    - Application: Water resource simulation
    - Role-driven agents (mayor, admin, etc.) with BDI logic
    - Communication: SACI/KQML, SOAP
    - Evaluation: Agents mimicked human behavior; passed Turing-style tests
    - Talk about concrete examples from the mentioned outcomes.
4. Davies - Unreal Tournament (FPS): Case Study
    - Challenge: Fast-paced, dynamic gameplay, human-like behavior in AI
    - BDI agents make context-sensitive decisions (e.g., hiding, healing)
    - External logic with limited perception mimics human sensory constraints
    - Heuristic-based reasoning
5. Barreto - Orphibs II (A-Life Simulation): Case study
    - BDI-inspired (Goal-Based Behavior) for emergent behavior
    - Agents manifest needs (hunger, social, energy) and genetically encoded traits
    - Environment interactions and population evolution studied
6. Dallatana - 0 A.D. – ABot (RTS): Case study
    - Agent-centric BDI system: every unit/building is an autonomous agent
    - Decentralized, scalable custom architecture (ABot) using domain-specific language (Botalk)
    - Showed human-like strategies and effective resource management
7. Discussion
    - Summarize agent scope and granularity, plus extension contributions to the base BDI model
    - Compare and contrast technical details (framework, environment, technologies)
    - Compare and contrast the discussed environments
    - Highlight key findings of each study
8. Conclusions
    - BDI agents significantly enhance game AI realism and player engagement
    - Applicability spans RPGs, FPS, A-Life sims, and RTS games
    - Promotes deeper player engagement and innovative agent-based game design