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Topics in SWE: Project Proposal

I changed the proposal completely, but I thought highlighting everything would make the document unreadable.

a. *Topic and Approach*

The topic I would like to focus on is **NPC population control in video games**. Following [1], I would like to test the proposed method for NPC population control and build on it. The testing part will be largely experimental, as the paper does not go into a lot of detail regarding the actual code. I plan on following the use of the anthill game in the beginning, and building on that idea by incorporating other themes that I found during my midterm paper research (e.g. prey-predator A-life in video games implemented by introducing an ant predator in the game). I want to experiment with different types of learning, such as reinforcement and imitation learning for ant behavior in the game (learning paths, gathering food) as well as the actual monitoring of population through food rationing. I plan on developing my own set-up (game and A-life model), by combining what I learnt from [2] , [3], and other mathematical models.

b. *Motivation*

It was difficult to settle on a topic, but I decided to explore more on the theme of my midterm paper. NPC population control is very important in video games, as the player has to feel immersed in the game and be faced with a familiar, realistic world. Therefore, there cannot be too many NPCs or too few, but rather the exact amount the game developer intended, no matter a player's actions or play style. I think this is an interesting topic that is not explored enough (as I have not found many resources). I believe my project can determine some of the possible approaches developers can take, and establish the validity of existing solutions (such as [1]).

c. *Research Papers + Repos (tentative)*

1. ANFIS-Based NPC Population Control in Video Games
2. Deep Variational Autoencoders for NPC Behaviour Classification
3. Evolving NPC Behaviours in A-life with Player Proxies