1 Is Test-Driven Development useful for performance optimisation when a game contains many character objects in use at the same time?

Test-driven development is becoming increasingly popular in the software engineering industry. I gather from my initial research that TDD has been shown to improve code quality and maintainability and allow for automated tests for regression testing. This is particularly useful as a system increases in size. As the complexity of a system increases, verification using automated tests becomes more costly to a development team in both time and resources particularly when writing code for games. There is a noticeable lack of the practice in the games industry perhaps for this reason but is this cost outweighed by the potential rise in bugs that a manually tested complex system can develop?

Large scale strategy games such as the games in the Total War franchise can be incredibly cpu and gpu heavy. This is because, at times, thousands of individualy renderes units are being simulated on screen. This creates a definite need for highly optimised code to reduce lag.

In this paper I intend to discuss how viable it would be to implement test driven development into the development process to help reduce performance issues in games handling mechanics with such a vast use of data.

I will need to do much more in-depth research into how optimisation is carried out in game development as well as the pro's and cons of TDD.

I will attempt to source the usage of TDD in games companies and general software development to evidence my findings.

I will contrast my findings with other methods developers use optimise this kind of code.

I will also briefly mention the experiences, or lack thereof, our team has had with optimisation and using TDD in our game and how we might include it in the future.

By the end of the paper I will hopefully have explored whether or not games with particularly large and complex object oriented systems can benefit from TDD or if the resource cost would outweigh these potential benefits.
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