Posudek diplomové práce

Matematicko-fyzikální fakulta Univerzity Karlovy

Autor práce Bc. Peter Lakatoš
Název práce Collision Avoidance in Computer Games
Rok odevzdání 2024
Studijní program Informatika **Studijní obor** Počítačová grafika a vývoj počítačových her

Autor posudku Mgr. Jakub Gemrot, Ph.D. **Role** Vedoucí
Pracoviště KSVI

Text posudku:

The student presents a thesis that deals with the navigation of game characters in the context of 3D computer games, focusing on the sub-problem of avoiding both static and dynamic obstacles. In his work, the student chose an unconventional approach to the solution by using a genetic algorithm (GA) to find specific curves along which game characters should move along a previously found path consisting only of individual segments. For this sub-problem, typically only reactive techniques based on determining the character's speed for the next frame of the game are used.

The student approached the work very carefully, worked consistently, and continuously took into account my comments and advice. The text of the thesis is logically divided, appropriately structured with a good level of detail, and without a significant number of grammatical errors. Given the unique approach, the student could not build on previous works, and thus the development involved prototypes and dead ends. I positively evaluate that the student actively came up with ideas on how to proceed and solve individual sub-problems throughout. The result is an algorithm that finds interesting and fairly natural paths for game characters, although this is my subjective assessment. Given that the algorithm contains multiple hyperparameters, the student conducted a large number of experiments to determine appropriate values for practical use. I also positively evaluate that in the final implementation, the student emphasized performance and the result, so the implementation for the Unity game engine can be used in real-time.

I consider the absence of a comparison of the algorithm's quality with existing approaches such as VO, RVO, or ORCA a limitation of the work, but I do not consider it a serious problem, as the student spent a significant amount of time implementing various variants of the algorithm before finding a suitable representation of genes and GA operators.

I recommend the thesis for defense.

Práci doporučuji k obhajobě.

Práci nenavrhuji na zvláštní ocenění.

Pokud práci navrhujete na zvláštní ocenění (cena děkana apod.), prosím uveďte zde stručné zdůvodnění (vzniklé publikace, významnost tématu, inovativnost práce apod.).

Datum 7.6.2024 **Podpis**