

Title: IVA Movement Quality Improvement for the Virtual Environment of Unreal Tournament 2004

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Abstract: PogamutUT2004 is an extension of the Pogamut platform designed for developing intelligent virtual agents (IVAs) in Unreal Tournament 2004. Navigation of IVAs in Pogamut is handled by a navigation system, which uses a navigation graph as an environment abstraction. Navigation mesh is a new, more advanced abstraction, but the existing navigation system is not capable of using its advantages. We created a new navigation system, which exploits advantages of the navigation mesh and solves several other issues of the old one. We show that the new navigation system improves the quality of navigation.

To demonstrate the quality improvement, an evaluation framework was created for the comparison of navigation systems. Systems were compared in terms of total number of significant paths on the map, which the system is able to follow, length of the path and time of the navigation.

We selected 18 different maps for thorough evaluation and we performed the basic evaluation on 58 other maps. The new system is more successful on 16 of the thoroughly evaluated maps, with moderate improvement of 6.75% in the success rate of the navigation. This improves the usability of the PogamutUT2004 as the platform for creating IVAs to several AI competitions and as an education platform.

Keywords: intelligent virtual agent, navigation, navigation mesh, path following