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Level of detail for crowd simulation

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Animation of crowds and simulation finds applications in many areas, including entertainment (e.g., animation of large numbers of people in movies and games), creation of immersive virtual environments, and evaluation of crowd management techniques. Interactive virtual crowds require high-performance simulation, animation and rendering techniques to handle numerous characters in real-time. These characters must be believable in their actions and behaviors. The main challenges are to remove the least perceptible details first, to preserve the global aspect of at best and meanwhile, significantly improve computation times. We introduce a level of detail system which is useful for varied animated crowds, capable of handling several thousands of different animated characters at interactive frame rates. The system is focused on providing rendering optimization, and is extended to build more complex scenes. This level of detail systems allows us to incorporate physics to the simulation and modify the animation of the agents as forces are applied to the models in the environment, avoiding rendering and simulation bottlenecks as much as possible. This way it is possible to render scenes with up to a quarter million characters in real time at interactive frame rates.

Biography

Leonel Toledo received his PhD from Instituto Tecnológico de Estudios Superiores de Monterrey, Campus Estado de México in 2014, where he, currently, is a Full-Time Professor. From 2012 to 2014, he was an Assistant Professor and Researcher. He has devoted most of his research work to crowd simulation and visualization optimization. He has worked at the Barcelona Supercomputing Center using general purpose graphics processors for high performance graphics. His thesis work was in level of detail used to create varied animated crowds. His research interests include crowd simulation, animation, visualization and high-performance computing.

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