

Havok™ AI

Efficient Pathfinding for Dynamic Game Environments



Havok AI is a platform-optimized SDK focused on efficient pathfinding and path following in dynamic game environments. Increase the productivity of your AI pipeline with our automatic navigation mesh generation. Create engaging NPCs by leveraging our optimized runtime to perform powerful AI queries. Bootstrap your AI development with out-of-the-box integration with Havok Physics, Animation and Destruction.

Cutting-Edge Game Design Features

With Havok AI, you have access to a powerful set of technologies designed to make next-generation game content creation fast and easy:

Automatic Nav Mesh Generation

When iterating on level content, navigation mesh generation is often a serious pipeline bottleneck. Havok AI provides a robust and fast automatic nav mesh generator that creates clean and optimized navigation meshes for typical game levels in seconds. This solution is easily integrated into existing tool chains. It allows designers to easily control the output by specifying exactly what should be included as part of the generation input. Arbitrary regions can be marked for exclusion and materials can be propagated through to the runtime in order to determine path costs. Generation of navigation data for flying and climbing characters is also supported.

Optimized Runtime

A range of optimized runtime queries allow NPCs to efficiently make decisions about their environment. These include:

- Single and multiple goal pathfinding and path smoothing
- Fast line of sight checking
- Spatial queries for finding the closest point / face on a navigation mesh and navigation mesh ray casting

All pathfinding queries are guided using a

hierarchical graph that dramatically reduces pathfinding costs. CPU and memory resources can be controlled by specifying a limited number of iterations or memory bounds. You can also control all path costs and heuristics directly allowing you to guide the searches exactly as required. All queries are multithreaded and SPU optimized without restriction on mesh size.

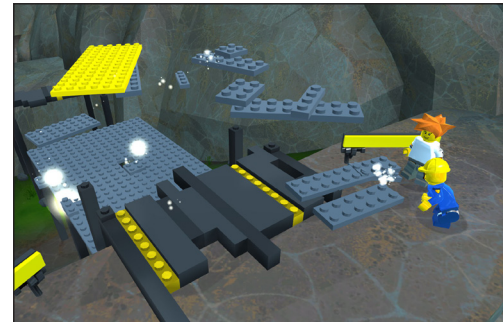
Dynamic Pathfinding

Havok AI is built from the ground up to consider dynamically changing environments. Leveraging our experience with Havok Physics, we've created a solution that allows efficient pathfinding in situations that present a huge challenge for static or augmented solutions. You control when and how characters should respond to changes in their path.

Streaming and Instancing

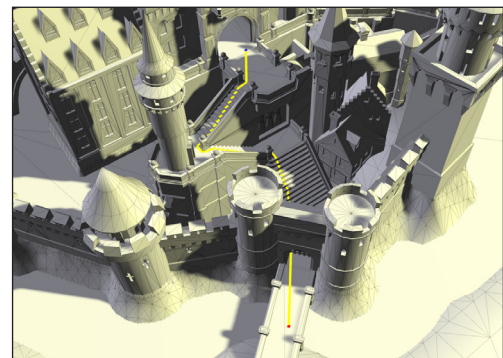
Our support for streaming allows you to create independent navigation meshes for each section of your world and dynamically stitch them together at runtime as required. You control when and how these sections are loaded and stitched as well as what happens when

(Design Features continued on Page 2)



Lego Universe
Image courtesy of NetDevil

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Cutting-Edge Game Design Features (Continued)

searches reach the boundary of the loaded sections. Instancing allows sharing of nav mesh data between worlds, allowing large memory savings for MMO servers.

Character Steering

Havok AI offers an out-of-the-box path following module that controls the motion of individual characters even in highly congested crowd scenes. Characters predict the motion of others in their vicinity and react accordingly, exhibiting natural queuing and flowing.

Cross-Platform Support

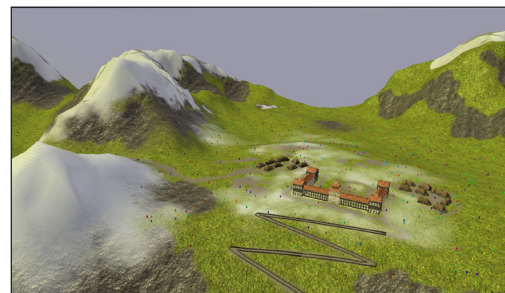
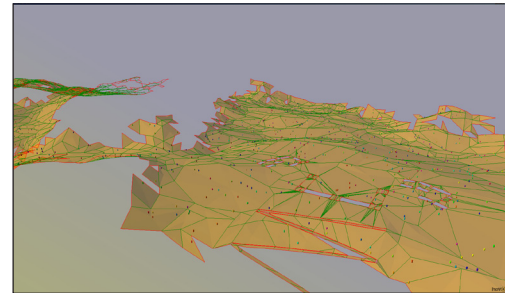
Havok AI is a true next-generation technology with full support for leading game platforms, including Microsoft® Xbox 360,® Sony® PLAYSTATION®3, Nintendo® Wii, PSP, PC, Linux, Mac, iPhone/iPad, and Android.

Seamless integration with Other Havok Products

Although Havok AI is designed to be integrated with any in-house physics and animation pipeline, it also ships with integration code that connects it with Havok Physics, Havok Animation and Havok Destruction. This out-of-the-box integration allows you to start working immediately with an optimally integrated suite of runtime components. Havok AI also provides a reference implementation for connecting Havok Behavior to Havok AI.

Industry Leading Support

Dedicated account managers from our world renowned Developer Relations group will work with your team to ensure you get the most from your Havok products.



Professional Services

Havok offers dedicated onsite professional services that provide focused assistance to help studios meet the ever-evolving demands of their development cycles.

For More Information

www.havok.com