

HOME OF VIRTUAL MOTORSPORTS

Summary of Graphical Updates

We're excited to announce a major graphical update to RaceRoom, designed to improve the visual experience and enhance performance. This update introduces significant improvements, making the game look more realistic while performing a lot better than ever before.

For this update, we focused our efforts on improving rendering quality and boosting performance while maintaining a clean and stable image that feels highly immersive. Anything that shimmers, pops or crawls into view is distracting and an immersion killer, this is why we have focused on eliminating or avoiding issues that can disrupt immersion, such as Z-fighting, aliased shadows or short shadow draw distances.

Here's a detailed summary of the key changes:

Performance Enhancements:

We have optimized the game's performance to ensure better framerates. This means you can enjoy the new graphics without sacrificing smooth gameplay. The gains were obtained through:

- **Optimized frustum culling:** By optimizing the frustum culling system, we can now skip rendering of a lot more objects that are not in the view. This results in significant gains, especially on large and complex tracks, such as the 24 Hours layout of the Nordschleife
- **Rearview mirror and reflection optimization:** The improved frustum culling system now allows us to render only what is necessary for the rearview mirror and dynamic car reflections. Furthermore, we have improved the looks and efficiency of the lowest car reflection setting significantly, which makes it a great option for those looking for extra performance.
- **Time Progression:** Performance of the time progression feature has been significantly enhanced, which means the performance difference to static time is now almost negligible

Color System Upgrade:

Transition to a LUT (Lookup Table) Color System. This change allows for more accurate and vibrant color representation, enhancing the overall visual fidelity of the game.



Graphics Update 2024 - Corvette C8R GT2, Laguna Seca



OLD



Graphics Update 2024 - BMW M4 DTM, Red Bull Ring



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Cloud Coverage Selector:

Added a new feature to the game menus and dedicated server allowing players to select cloud coverage options. You can now choose from clear, few clouds, scattered clouds, and overcast skies, adding a dynamic and realistic touch to the racing experience.

Improved Shadows Rendering:

Shadows have been significantly improved, providing more realistic and dynamic lighting effects across various environments. This includes soft, anti-aliased shadows, with higher resolution and much longer draw distances. Shadows are now also rendered in the rearview mirror.

Auto-Exposure Feature:

Introduced an auto-exposure feature that dynamically adjusts the brightness based on the scene's lighting. This feature enhances visibility in different lighting conditions, ensuring a more immersive experience.

Improved car paint and car parts materials rendering:

Better support has been added for all different types of liveries and paint found on racing cars. Most notably, chrome, matte and metallic parts can now be represented much more accurately.

Improved Car Cockpit:

Improved lighting inside the cockpit, to achieve a much more realistic and immersive view.

Improved Car Reflections:

Car reflections have been enhanced to better mimic real-world reflective surfaces, adding depth and realism to vehicle reflective parts, such as windows.

Improved Specular Reflections:

Specular reflections have been fine-tuned to provide more realistic highlights and shine, especially under varying light conditions.

Improved Track Surface Lighting:

The track surface lighting has been improved, giving a more accurate representation of light reflection on road surfaces and built-up rubber.

Improved Depth of Field Blurring:

Depth of field effects have been refined for more realistic background blurring, enhancing the sense of speed and focus.



HOME OF VIRTUAL MOTORSPORTS

Improved Motion Blur:

Motion blur has been updated to provide a more natural and immersive sense of movement and a reduction of artifacts.

Improved Rendering of Headlights and Taillights:

The rendering of headlights and taillights has been improved, making dawn, morning, noon, afternoon, and sunset racing more visually striking and realistic.

Improved Vegetation lighting:

Trees are now blending in much better in the lighting environment.

Track Grass normalmaps:

Our normal maps are now properly reacting to orientation of the light

Track material specular:

Until now, only a few objects had specular around our tracks. This is now addressed so all objects reflect strong lights.

Performance mode through Vulkan rendering pipeline:

The vulkan-based implementation of d3d9 by Philip Rebohle was already a popular rendering mod among the RaceRoom community, providing a significant performance boost. Our engine is now supporting this mod more officially as we addressed some visual glitches that had been impairing the experience. A start-up option in Steam will be available to start RaceRoom using Vulkan.

Eliminated Z-Fighting:

We have completely eliminated z-fighting artifacts by adapting the engine to use the more modern 'Reversed-Z' approach to handle depth in the rendering.

Particle lighting:

Particles now properly react to different lighting conditions

Sharpening:

This effect increases the visual crispness of the game, making textures and fine details stand out more prominently. However, because the visual experience is based on individual preferences, the default setting will be off.



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These updates mark a significant step forward in the visual and performance quality of RaceRoom.

KW Studios is a small team of highly talented and motivated individuals committed to providing the best possible products, and this graphical overhaul is a testament to that commitment.

We can't wait to continue modernizing the engine by going even more in depth and unlocking highly efficient render techniques offered by more recent DirectX versions.

For this (and more!), we are still on the lookout for a senior programmer - This may be you? If not, please make sure to share the ad around - <https://kw-studios.com/jobs/lead-cpp-programmer/>

