Temporal Rendering

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Zaawansowane Techniki Grafiki Komputerowej

Motion Vectors

Motion vectors are per-pixel two dimensional displacement vectors that describe how a point in the scene moves from one frame to another in screen space coordinates.

Motion Vectors

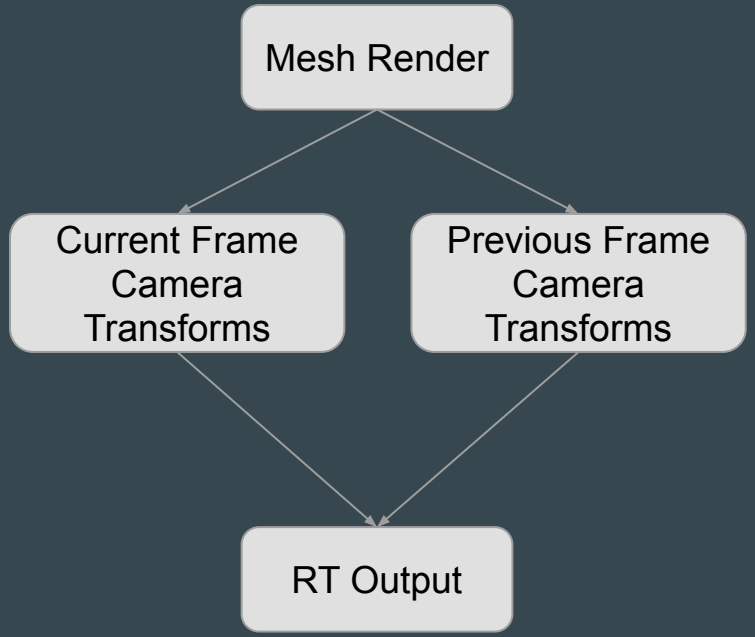
- Camera Movement
- Object Movement
- Camera Jitter
- Reprojection
- Anti-Aliasing
- Issues
  - Disocclusion
  - Ghosting

Motion Blur

- Camera Movement
- Object Movement

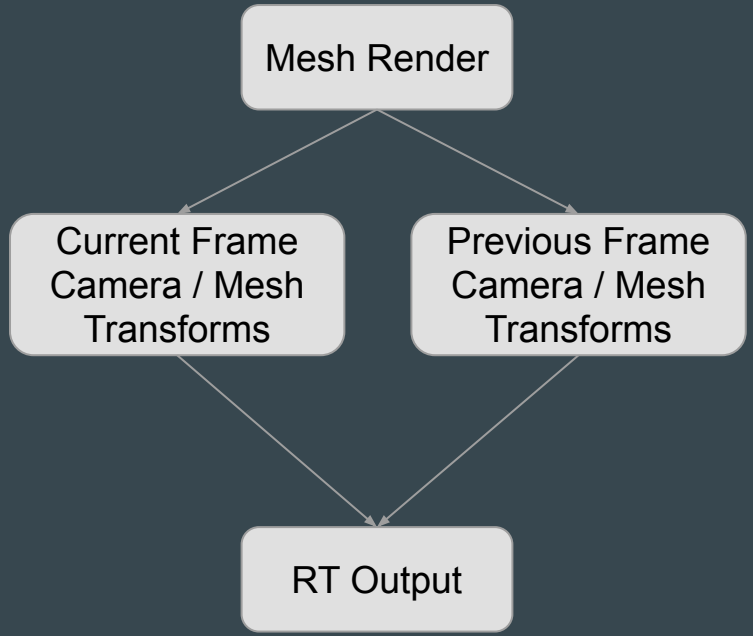
Camera Movement

Render Pass



Object Movement

Render Pass



Camera Jitter

Tiny, deliberate sub-pixel offset applied to the camera's projection each frame, primarily to improve anti-aliasing through temporal techniques and to provide better input for temporal upscaling.

Camera Jitter

- Halton (2,3) Sequence
- Hammersley Sequence
- Sobol Sequence
- R2 Sequence

Reprojection

It’s the process of mapping pixels from a previous frame into their corresponding positions in the current frame, so the renderer can reuse historical information for temporal techniques.

Temporal Anti-Aliasing

Reduces aliasing by combining the current frame with reprojected samples from previous frames, using camera jitter and motion vectors to accumulate sub-pixel detail while rejecting invalid history.