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CSC 461
Depaul Winter 2020

Particle System Logs

Num Particles: 100,000
Max Life: 10 s
Final Time Release: ~33s

- Changelist: 34630 (3/8/2020 4:08 PM)
  - changed all usage of doubles to floats
    - Reduction: 10ms

- Changelist: 34947 (3/9/2020 3:07 PM)
  - Implemented two linked lists method: pointer to active and dead particles, no previous particle pointer
    - Reduction: 10ms

- Changelist: 34950 (3/9/2020 3:15 PM)
  - Removed vestigial drawbuffer code (no more stl use)
    - Reduction: 30ms

- Changelist: 36483 (3/13/2020 4:44 PM)
  - moved invariants outside of loops
  - reduced debug but not release

- Changelist: 36810 (3/14/2020 4:47 PM)
  - 16 bytes aligned particles, block loaded
  - __m128 data member for Vect4D
    - Reduction: 3ms

- Changelist: 36854 (3/14/2020 6:25 PM)
  - SIMD progress 1
  - moved invariant out of main loop

- Changelist: 36897 (3/14/2020 8:05 PM)
  - Vector functions SIMD (except cross)
    - Reduction: 3ms

- Changelist: 37112 (3/15/2020 12:44 PM)
  - Matrix functions SIMD (except the ugly ones)
  - convert particle curr diff prev rows to matrices

- ■ Reduction: 4ms

- ● Changelist: 37463 (3/15/2020 11:56 PM)
  - ○ attempted align16 with new/delete
  - ○ 5 ms increase
  - ○ reverted to old method

- ● Changelist: 37620 (3/16/2020 10:38 AM)
  - ○ Moved openGL goo out of draw loop
    - ■ Reduction: 6ms

- ● Changelist: 37650 (3/16/2020 12:38 PM)
  - ○ tested making particleEmitter data members dynamically allocated

- ● Changelist: 39515 (3/20/2020 12:41 PM)
  - ○ clean up the draw function
  - ○ no pivotParticle or pivotMatrix, transMatrix replacing cameraMatrix

- ● Changelist: 39523 (3/20/2020 1:06 PM)
  - ○ main cleanup update section
  - ○ removed odd duplicate variables and function calls

- ● Changelist: 39549 (3/20/2020 2:42 PM)
  - ○ calcTransform
  - ○ calculate the transform of the particle with one function
    - ■ Reduction: 3ms
  - ○ losing hope as ideas run low

- ● Changelist: 39949 (3/21/2020 10:39 AM)
  - ○ fixed a periodic crash that occurred in release
  - ○ fix: redid the kill particle loop

- ● NOT A CHANGELIST
  - ○ set the program to the nvidia graphics card on my computer
    - ■ Reduction: 75ms

- ● Changelist: 39950 (3/21/2020 11:05 AM)
  - ○ check to see if old matrix mult method is now faster, along with many many other things
  - ○ nothing tested reduced time

- ● Changelist: 40201 (3/22/2020 10:54 AM)
  - ○ calcTransform returns float* now (was Matrix)

- ■ Reduction: 1ms

- ● Changelist: 40639 (3/23/2020 9:34 AM)
  - ○ Default constructors (i had tried this and many other things prior but no significant reduction occurred due to larger times of incorrect graphics card
    - ■ Reduction: 0.9ms

- ● Changelist: 40692 (3/23/2020 3:40 PM)
  - ○ Compiler changes
  - ○ Compiler: Floating point precision: fast
  - ○ Compiler: Link Time Code Generation: Use Link Time Code Generation
    - ■ Reduction: 0.8ms