Particle System Analysis

- Particle

This part is responsible for each particle. It contains information of particle, such as position, life, velocity, scale, rotation, etc. It also contain the pointer to the previous and next particle.

Optimization analysis

- This may be able to divide into Hot and Cold particle to increase speed.

- Rearrange the data to optimize the memory.

- It missing properly Big 4. Have to implement them.

- Particle Emitter

This part is responsible to spawn the particles and add them to the list, then update and draw to the screen.

Optimization analysis

- It missing properly Big 4. Have to implement them.

- Rearrange the data to optimize the memory.

- It call new to spawn particle every time. It seems inefficient. Maybe we can add another method or class to contain particle to be called for them.

- It use two list, which one of it (particle_list) is not being used AT ALL! So, there may be a way to rework or get rid of list completely.

- It seems like the draw and execute have nothing to do with diff_row and not use them. Maybe we can rework or get rid of them too.

- Change <double> to <float>

- Vect4D

This part is responsible for vector that used in this program. It contain basic operation for vector calculate.

- It missing properly Big 4. Have to implement them.

- Change to use SIMD

- Change <double> to <float>

- Matrix

This part is responsible for matrix that used in this program. It contain basic operation for matrix calculate.

- It missing properly Big 4. Have to implement them.

- Change to use SIMD

- Change <double> to <float>

- Other

- Change <double> to <float> in other file

- Change compiler setting

Estimate improved performance

- Particle : 1.25 – 1.5 times faster
- Particle Emitter : 1.5 times faster
- Vect4D : 1.25 times faster
- Matrix : 1.25 times faster
- Overall : 2 - 3 times faster