

GPU-backed Bullet Hell Game Engine

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E190U

CPU vs GPU

- CPU
 - Fast serial commands
 - Performs single-threaded algorithms very quickly
 - Exhausts parallelism relatively quickly
- GPU
 - Numerous parallel operations
 - Extremely high level of parallelism
 - Slower at individual complex operations



Game Engines

- Game Logic
 - Often sequential
 - High levels of interdependencies
- Graphics
 - 3D graphics require a lot of parallelizable compute time
 - Many rendering algorithms require numerous independent threads of computation.

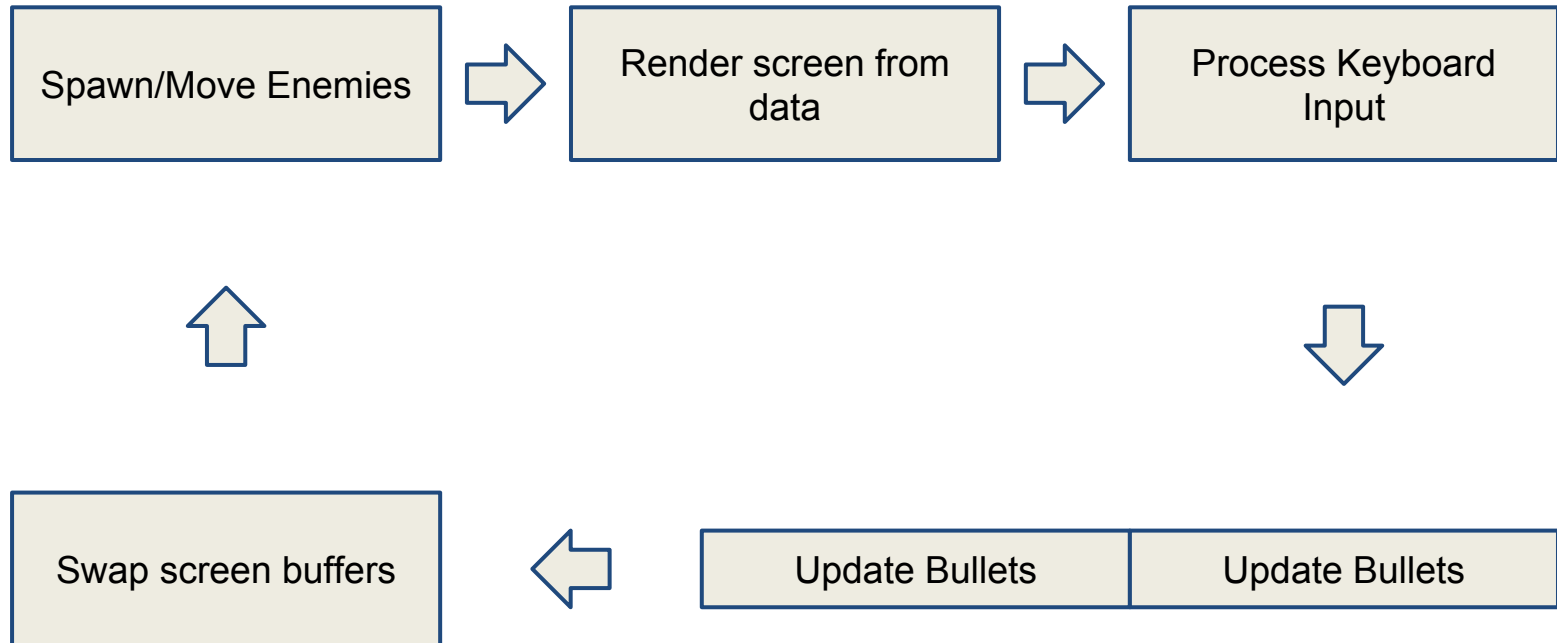
E190U: VIDEO GAME CONSOLE DESIGN



Bullet Hell Game Engines

- Game Logic
 - High numbers of independent entities
 - Each entity performs moderately simple operations
- Graphics
 - Simple 2D graphics
 - Ultimately boils down to the generally serial “Painter’s algorithm”

Simplified Serial Bullet Hell Game Logic



Simplified Parallel Bullet Hell Game Logic

