Extremescale visualization and simulation

1. Real time microscopic simulation, generation, animation and rendering of crowds with varied characters using the GPU.
2. Parallel simulation and visualization of large crowds using HPC heterogeneous clusters.

Summary

Simulation and visualization in real time of large crowds with varied animated characters. These are explored from several fronts

- **Computer Graphics:**
  - Generation of diverse characters (GoD)
  - Animation variety and transfer
  - Level of Detail (LoD)
- **Agent Intelligence:**
  - Effective search of neighbours
  - Collision avoidance
  - Physical, psicological and cultural characteristics of agents
Optimal navigation

- Parallelism:
  - Simulation with one node parallelism
  - Simulation on a cluster
  - Generating visualization in HPC heterogeneous clusters
  - Diverse interactive graphical clients

- Real data and learning:
  - Using real trajectories
  - From video

- Real environments:
  - OpenStreetMaps

Objectives

Real time microscopic simulation, generation, animation and rendering of crowds with varied characters using the GPU and heterogeneous architectures.

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