

Interactive Simulation and Visualization of Flooding Scenarios

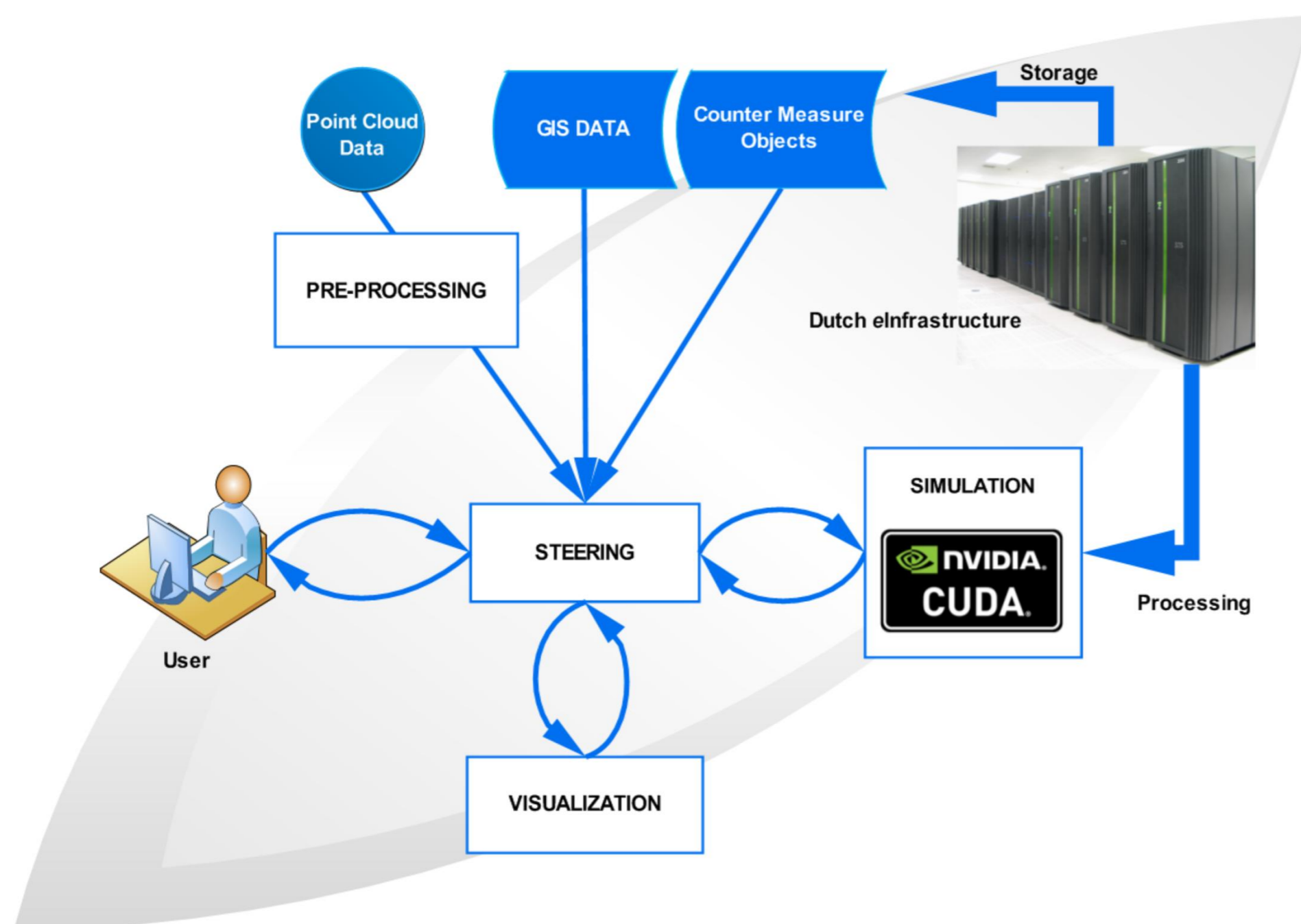
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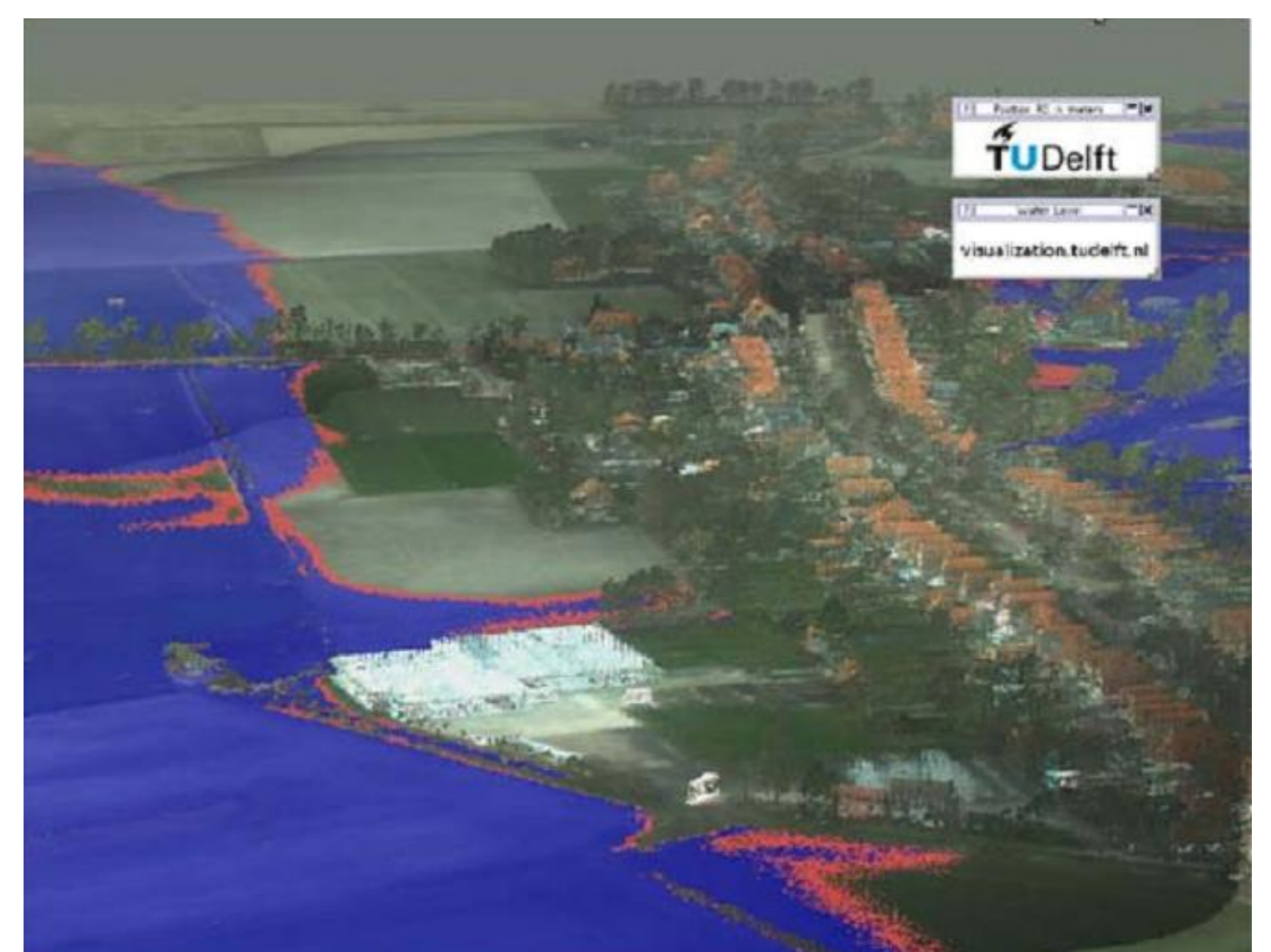
Poster Summary

- coastal region under threat of floods
- CFD simulation for flood protection discussions
- computational steering needed for scenario-driven communication
- support flooding-aware environment amongst shareholders, geo-scientists and the public



Large-Scale AHN2 Visualization

- point cloud model of the Netherlands: >8TB
- continuous Level-of-Detail visibility
- feature-adaptive samples
- point cloud compression



Interactive and Adaptive Flooding Simulation

modern interactive simulations:

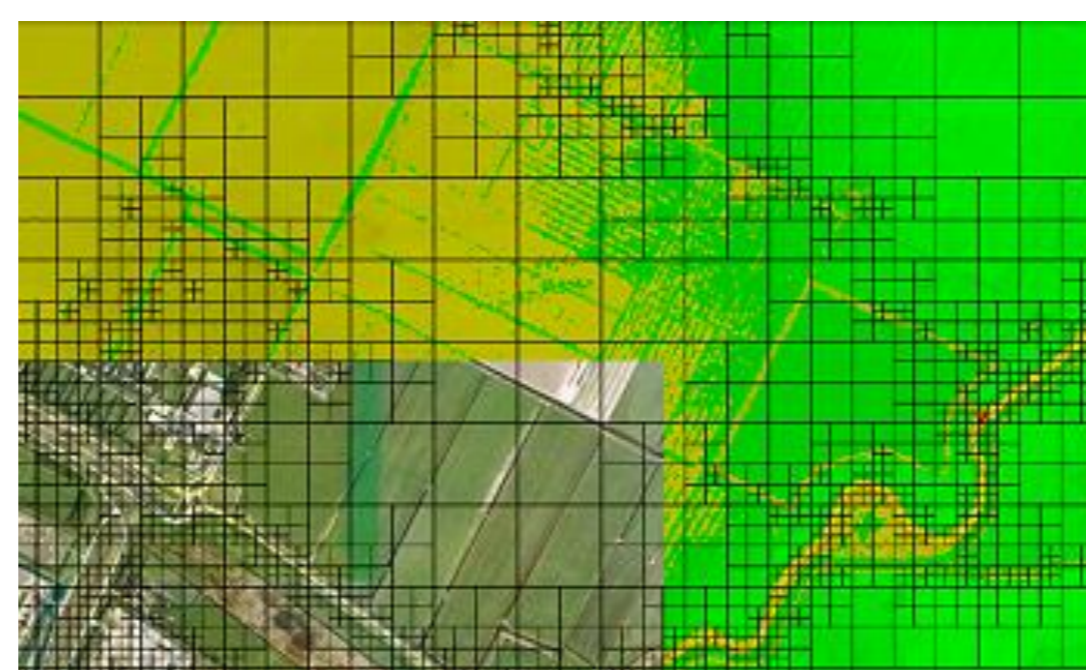
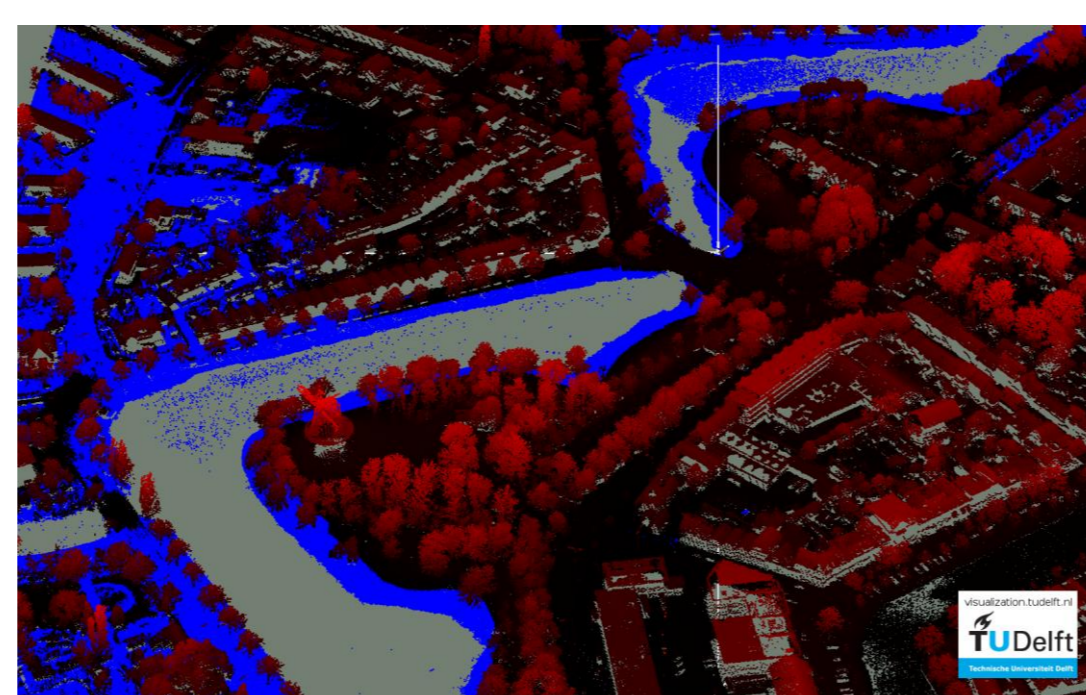
- small scales
- simple CFD models

Challenge:

- large scales
- complex CFD models

Approach:

- massive parallelism on Heterogeneous Architecture with CUDA
- Simulation on Subgrids
- user group-dependent calculation accuracy



Multi-Scenario, comparative Simulation Visualization

Demands:

- counter-measure integration
- multiple flooding scenarios in parallel

Challenge:

- meaningful comparative visualization
- in-situ simulation modifications
- computational steering

Technology

- “CUDA Fortran” and “CUDA for Python”
- Virtual Reality Environment VRmeer
- OpenSceneGraph, ParaView