The poster presents a scalable approach that converts the results of large-scale Computational Fluid Dynamics (CFD) simulations into a geometric representation and costly volume rendering-based visualization. One of the main contributions is to present a parallelized version of the voxelization algorithm for volumes that can be directly loaded into memory, as long as the number of elements and domain volume is significantly smaller than the hardware. This approach requires an appropriate load-balancing. Unfortunately, load-balancing according to the number of cells or cell volumes does not work since the complexity of the voxelization process is computationally demanding as high-precision simulations are required for the simulation of more complex problems in Computational Fluid Dynamics (CFD). The simple load-balancing according to the number of cells or cell volumes does not scale for unstructured meshes with high growth rates typical in CFD. In the present work, we propose a novel method for the sequential balancing of large unstructured meshes in memory to scale up to just several seconds with significantly improved scalability.

**STEP 01**

**OpenFOAM**

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