

Algorithm of grid-based blurring

Data: OldLevelSet - given level set values, UserSmoothingFactor - smoothing factor, provided from user, FluidParticlesCount - number of particles in the neighbourhood of grid cell

Result: BlurredLevelSet

begin

$$\text{maxNeighbourCount} = \frac{\text{CellSupportRadius}^3}{\text{FluidParticleRadius}^3}$$

for $\text{vert} \in \text{GridVertices}$ **do**

$\text{neighbors} = \text{findCellNeighbors}(\text{vert})$

$\text{newLevelSetValue} = \text{OldLevelSet}[\text{vert}]$

for $\text{neighborVert} \in \text{neighbors}$ **do**

$\text{newLevelSetValue} = \text{newLevelSetValue} + \text{OldLevelSet}[\text{neighborVert}]$

end

$$\text{newLevelSetValue} = \frac{\text{newLevelSetValue}}{\text{neighbors.size()}} + 1$$

$$\text{factor} = \min(1, \text{UserSmoothingFactor} \cdot \frac{\text{FluidParticlesCount}[\text{vert}]}{\text{maxNeighbourCount}})$$

$\text{BlurredLevelSet}[\text{vert}] =$

$\text{OldLevelSet}[\text{vert}] \cdot (1 - \text{factor}) + \text{factor} \cdot \text{newLevelSetValue}$

end

$\text{return BlurredLevelSet}$

end