

atan2 from trigonometry

ElementSets from MeshConnectivity

OrientedVertices from Neighborhoods(*M*)

*M* : TriangleMesh

$$x_i \in \mathbb{R}^3$$

*V*, *E*, *F* = *ElementSets*(*M*)

$$\Omega_f(\mathbf{p}) = 2 \operatorname{atan2}(|[\mathbf{a} \ \mathbf{b} \ \mathbf{c}]|, (a \ b \ c + (\mathbf{a} \cdot \mathbf{b}) \ c + (\mathbf{b} \cdot \mathbf{c}) \ a + (\mathbf{c} \cdot \mathbf{a}) \ b))$$

where

$$f \in F$$

$$\mathbf{p} \in \mathbb{R}^3$$

$$\mathbf{a} = x_i - \mathbf{p}$$

$$\mathbf{b} = x_j - \mathbf{p}$$

$$\mathbf{c} = x_k - \mathbf{p}$$

$$a = \|\mathbf{a}\|$$

$$b = \|\mathbf{b}\|$$

$$c = \|\mathbf{c}\|$$

*i*, *j*, *k* = *OrientedVertices*(*f*)

$$w(\mathbf{p}) = \frac{1}{4 \ \pi} \sum_{f \in F} \Omega_f(\mathbf{p}) \text{ where } \mathbf{p} \in \mathbb{R}^3$$