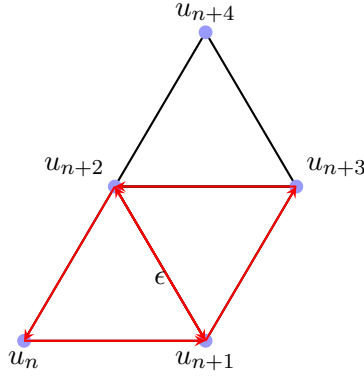


1 Interpolation of Tensor Calculus with UNNS

Theorem 1.1 (Curvature as Echo Amplification on a Mesh). *Let u_n be a UNNS nest defined on a 2D simplicial complex. Propagating u_n across adjacent edges accumulates an echo residue ϵ , measured by deviation after a closed traversal of the mesh. This accumulated echo is the discrete analog of curvature R_{jkl}^i .*



Echo accumulation around triangular loops in a simplicial mesh.

Remark 1.2. *The triangular mesh illustrates that:*

- *Each edge carries a UNNS coefficient (c_i).*
- *Closed loops around faces accumulate echo residues.*
- *The global sum of echoes corresponds to curvature integrated over the surface, in analogy with Gauss–Bonnet.*