

DEMOS

Demos: `./DirectionalFieldSynthesis/demos/external/libdirectional/examples`

DEMO: TRIVIAL CONNECTIONS

- **Input:**

- Original vertex curvatures k_0 .
- Prescribed curvatures k (cone singularities and flat vertices).

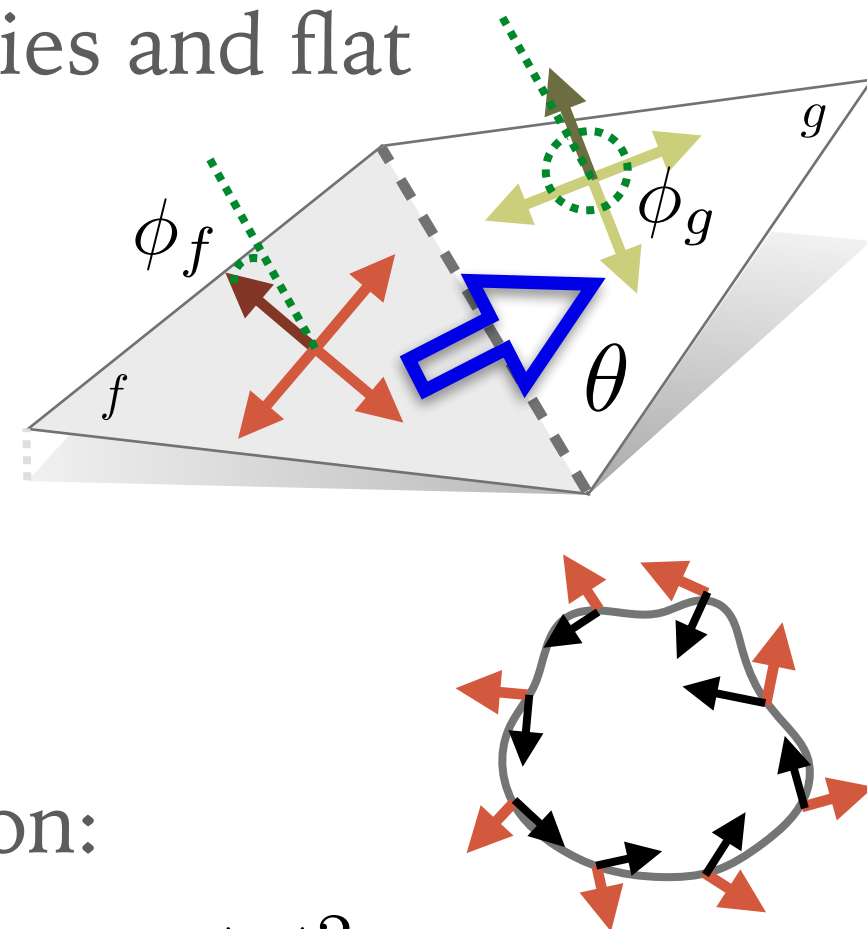
- **Output:**

- Edge-based deviation from parallelity θ .
- Objective: as-parallel as possible.
- Linearly-constrained quadratic minimization:

As parallel as possible \longrightarrow

$$\theta = \operatorname{argmin} |\theta|^2 \text{ s.t.}$$

Prescribed Singularities \longrightarrow $(d_0)^T \theta = k - k_0$



DEMO: GLOBALLY OPTIMAL

- **Input:** N-RoSy (single complex) per constrained face

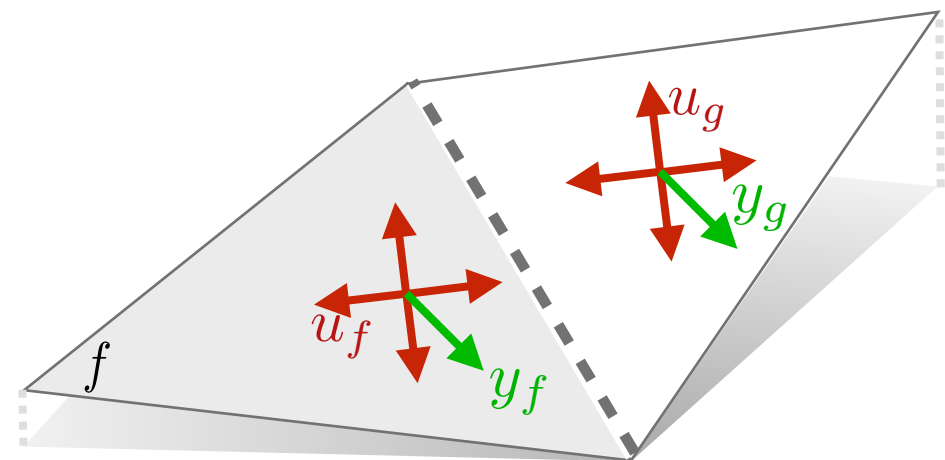
$$y_f = (u_f)^N$$

- **Output:** interpolation to all free faces $y_{f_{known}} = (u_{f_{known}})^N$

- Minimizing energy: $\min_{\mathbf{y}} E_{smooth}(\mathbf{y})$

$$E_{smooth}(\mathbf{y}) = \sum_{(f,g)} \left| (\bar{e}_f)^N y_f - (\bar{e}_g)^N y_g \right|^2 = \mathbf{y}^T Q \mathbf{y}$$

- Take roots of all y_f



DEMO: POLYVECTORS

- Representing set of polynomial coefficients instead of single N-RoSy.
- Roots of polynomial = directional.
- Interpolating each like in globally optimal.

