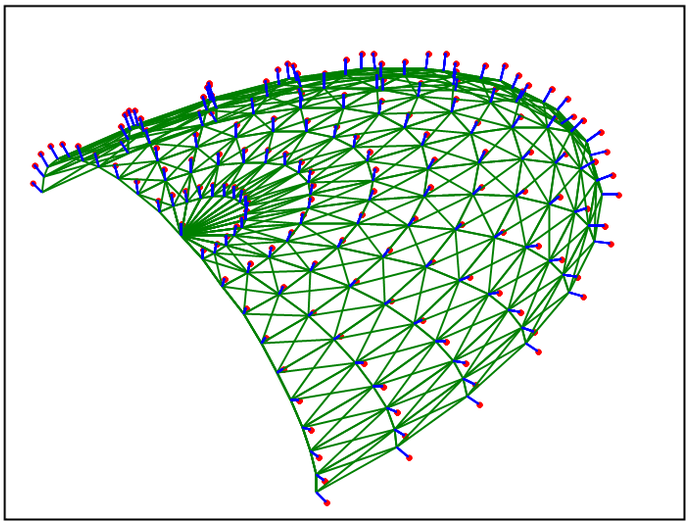
Normals to the surface on Rezonar's triangular mesh

Rezonar's triangular mesh

$$NormSur(x, s, h) := \left| \begin{array}{l} \left[c := [1..3] \quad g_c := \frac{d}{dx_c} f(x) \quad G(x) := g \right] \\ \text{for } k \in [1..\text{rows}(s)] \\ \quad \left| \begin{array}{l} \left[nodeInit_k := \text{eval}(\text{row}(s, k)) \quad eN_k := \text{eval}\left(\frac{G(nodeInit_k)^T}{\text{norme}(G(nodeInit_k))} \right) \right] \\ \left[nodOffs_k := \text{eval}(nodeInit_k + h \cdot eN_k) \quad No_k := \text{stack}(nodeInit_k, nodOffs_k) \right] \\ nodOffs2d_k := \text{eval}(\text{augment}(\text{col}(nodOffs_k \cdot \gamma, 1), \text{col}(nodOffs_k \cdot \gamma, 2))) \\ arrow_k := \text{eval}(\text{augment}(\text{col}(No_k \cdot \gamma, 1), \text{col}(No_k \cdot \gamma, 2))) \\ tip_k := \text{eval}\left(\left[\text{col}(nodOffs2d_k, 1)_1 \quad \text{col}(nodOffs2d_k, 2)_1 \quad "." \ 8 \ "red" \right] \right) \end{array} \right. \\ pCycleC(A) := \left| \begin{array}{l} M := [A_1] \\ \text{for } k \in [1..\text{length}(A)] \\ \quad \left| \begin{array}{l} \text{for } n \in [1..5] \\ \quad M_{\text{rows}(M)+1} := [10^5 \ 10^5] \\ M_{\text{rows}(M)+1} := A_k \end{array} \right. \\ \text{eval}(\text{mat2sys}_1(M)) \end{array} \right. \\ plot := \begin{cases} pCycleC(arrow) \\ "" \\ \text{augment}(\text{col}(s \cdot \gamma, 1), \text{col}(s \cdot \gamma, 2)) \\ \text{mat2sys}_1(tip) \end{cases} \end{array} \right.$$

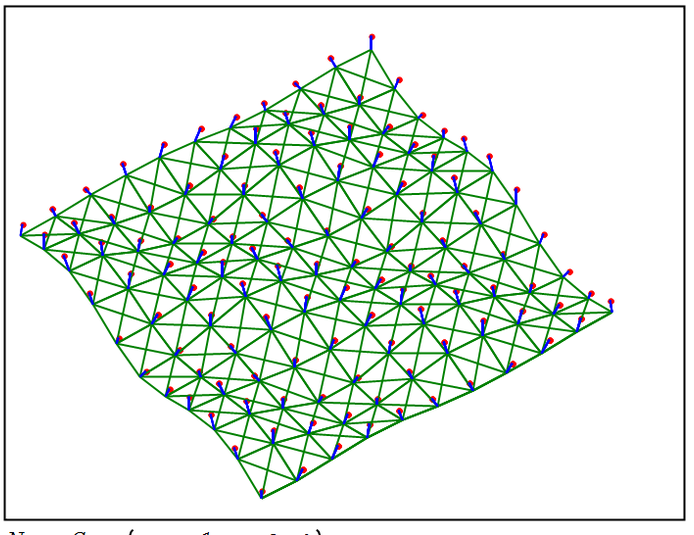
PTMesh

$$f(x) := \frac{(x_1)^2}{3^2} + \frac{(x_2)^2}{1.5^2} + \frac{(x_3)^2}{1^2} - 1$$



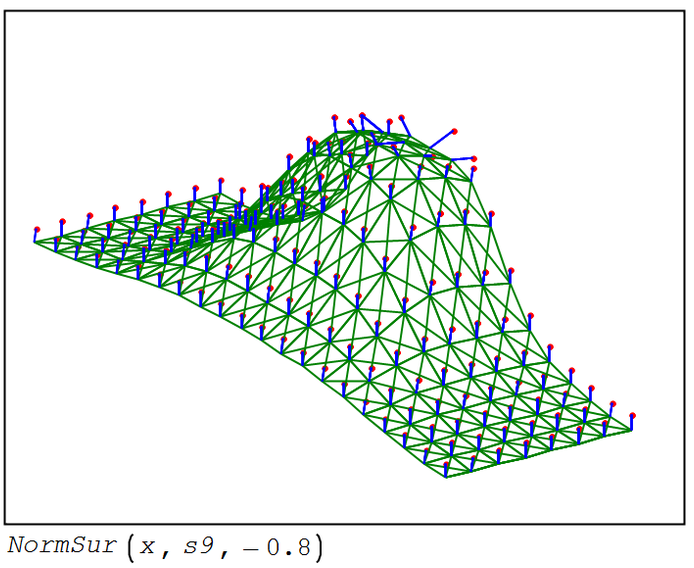
$NormSur(x, s3, 0.3)$

$$f(x) := 0.5 \cdot \sin(x_1) \cdot \sin(x_2) - x_3$$



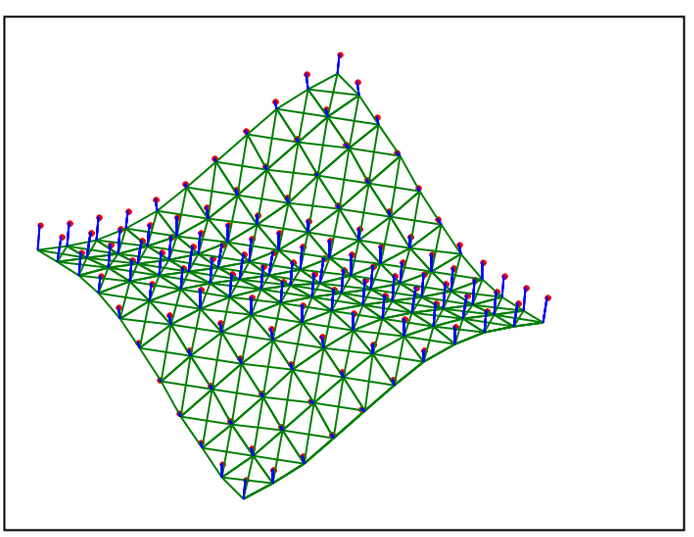
$NormSur\left(x, s1, -0.4\right)$

$$f\left(x\right) := 9 \cdot \frac{0.01 \cdot \mathbf{e}^{x_1}}{0.094 + \left(x_1\right)^4 + \left(x_2\right)^4} - x_3$$



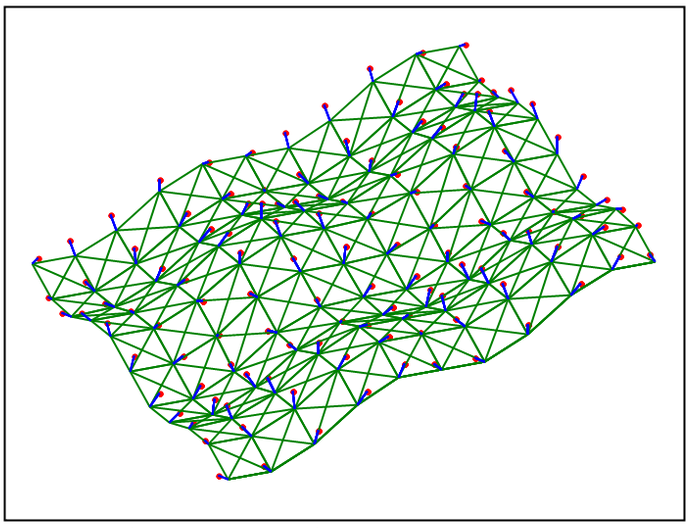
$NormSur\left(x, s9, -0.8\right)$

$$f\left(x\right) := \sin\left(0.5 \cdot x_1 + 0.5 \cdot x_2\right) - x_3$$



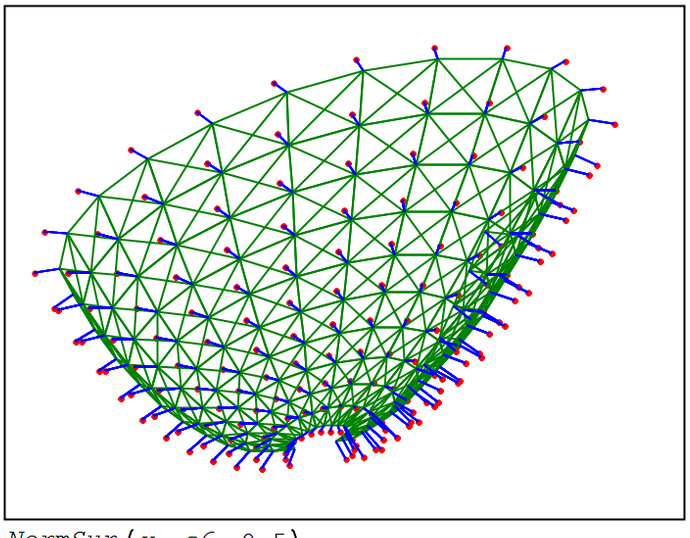
$NormSur\left(x, s4, -0.7\right)$

$$f(x) := 0.5 \cdot \left[\sin\left(x_1 + x_2\right) + \cos\left(x_1 - x_2\right) \right] - x_3$$



$$NormSur(x, s5, -0.4)$$

$$f(x) := \frac{x_1^2}{2^2} + \frac{\left(x_2\right)^2}{1^2} - x_3$$



$$NormSur(x, s6, 0.5)$$