Measures for Surface Comparison on Unstructured Grids with Different Density

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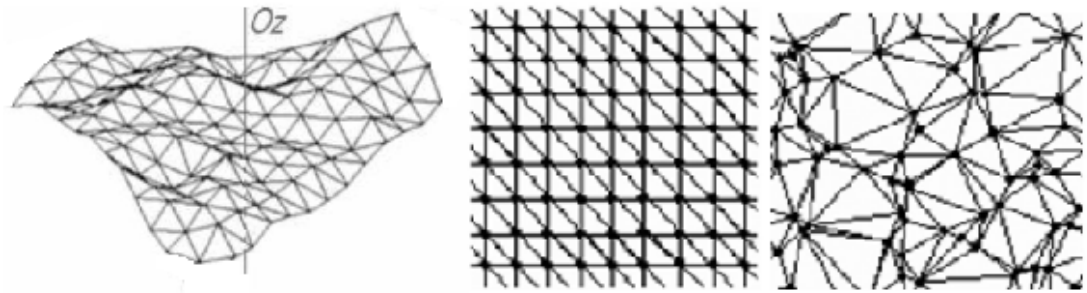
Problem Statement

Problem of surface comparison acquired by 3d scanner as point clouds that can be projected onto a plane explicitly:

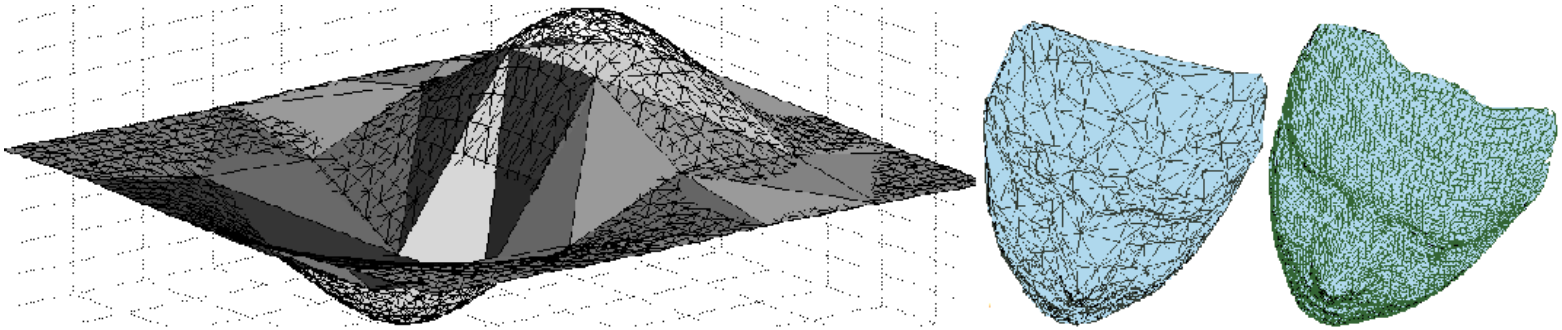


Problem Statement

- **Initial data:**
  - Two single-valued surfaces S_1, S_2 presented as functions f_1, f_2 on two *different* point sets — nodes of discrete grids g_1, g_2. Grids g_1, g_2 can be unstructured and have different density.
- **Requirements:**
  - Introduce disparity measures for surfaces S_1, S_2;
  - Design a computationally efficient algorithm to compute the measures.

Results

- New measure adapted for surface comparison defined on unstructured grids with different density is introduced.



- The measure uses only *interface* fragments of surfaces — fragments that are represented by nodes of both grids. A new algorithm for interface triangles extraction is proposed. *Linear* computational complexity of the algorithm was proved.
- Computing experiments for the proposed measure on real data were carried out.
- The proposed approach of surface comparison was considered for several applications of 3d face models analysis.