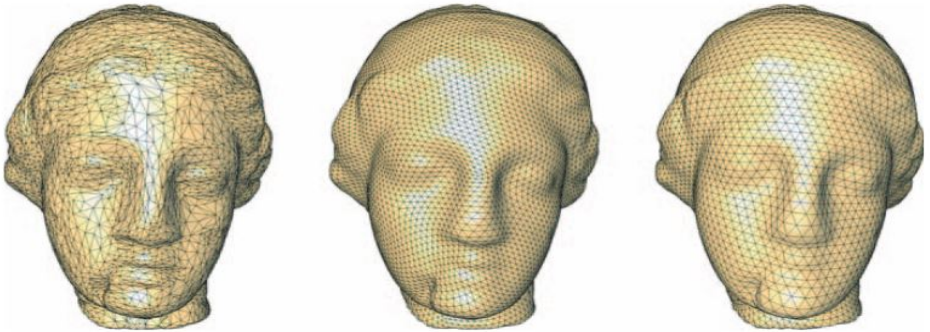
Connectivity Regularization

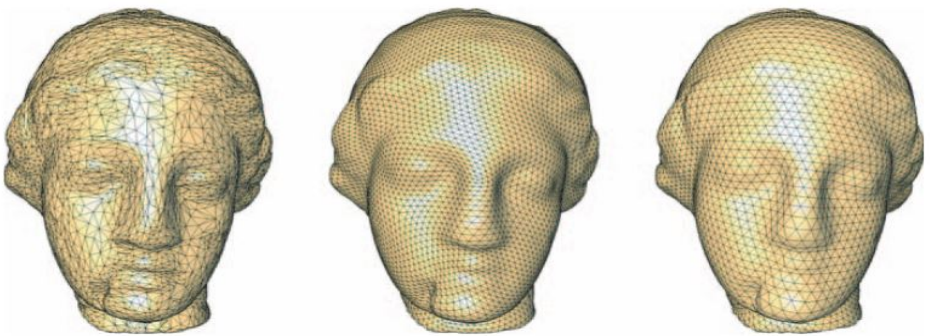
Goal:
Improving mesh quality, using local operations



Regularity of meshes

- Regular meshes: all vertices are connected to a constant number of neighbor vertices

- Advantage:
  - Simpler Connectivity graph
    → Efficient traversal and localization in algorithms

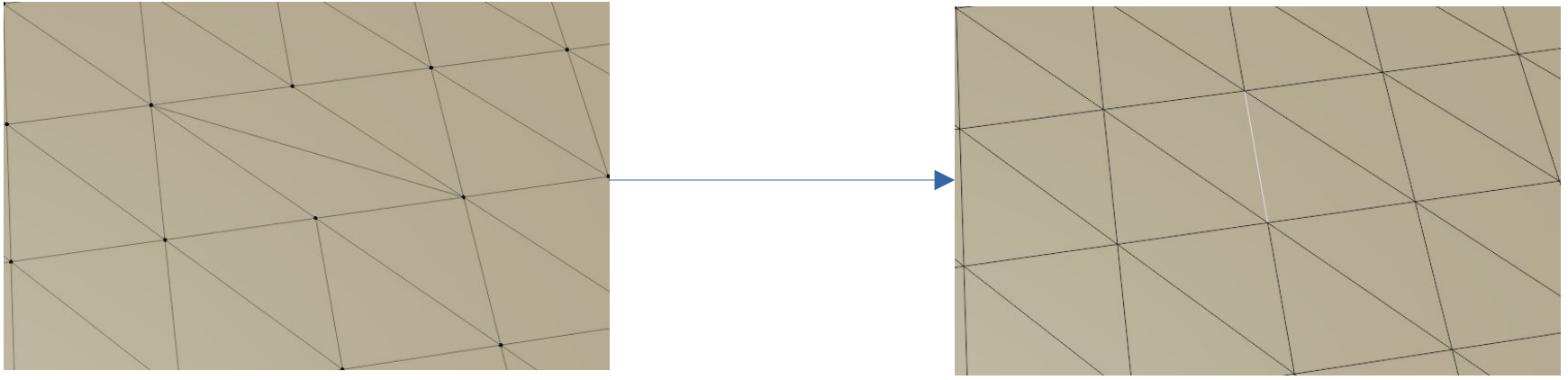


Irregular semi-regular regular

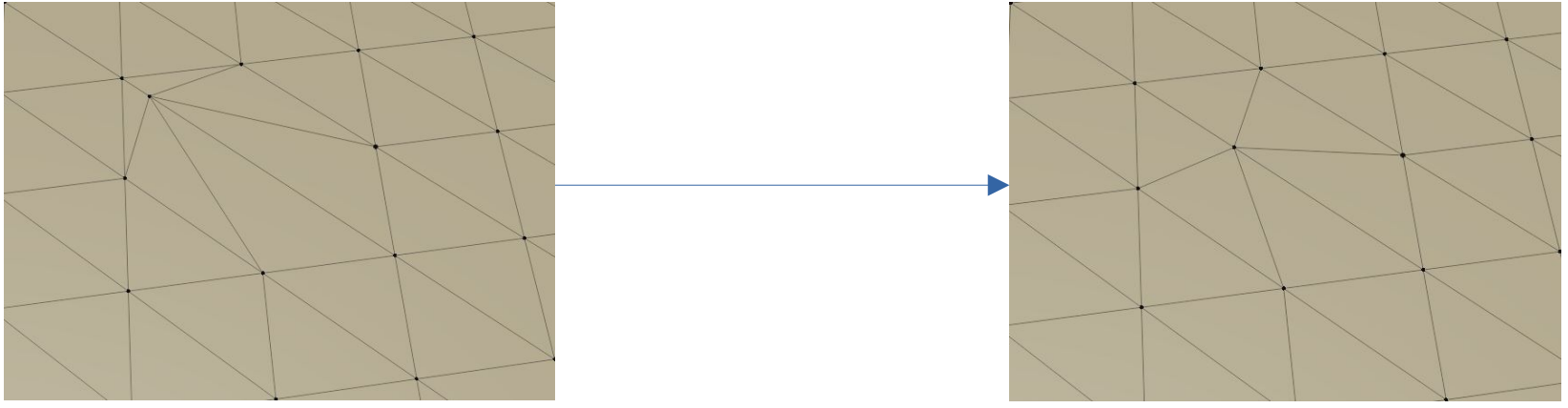
Approach

- Local Operations:
  - Edge Flips, Splits and Collapses
  - Angle-based Smoothing

Improve Vertex degree



Improve inner angles



Features

- Work with manifold meshes
- Try to stay close to the original shape of the mesh
- Controls:
  - As little as possible
  - Settings for smoothing
  - Thresholds for edge operations

References

- Alliez, P., Ucelli, G., Gotsman, C., & Attene, M. (2008). Recent Advances in Remeshing of Surfaces. In L. De Floriani & M. Spagnuolo (Eds.), Shape Analysis and Structuring (pp. 53–82). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-33265-7_2
- Surazhsky, V., & Gotsman, C. (2003a). High quality compatible triangulations. Engineering with Computers, 1(1), 1–1. https://doi.org/10.1007/s00366-004-0282-6
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