**Title of the paper**

An approach to achieving optimized complex sheet inflation under constraints.

**Main contributions**

We propose a new approach to achieving sheet inflation that can:

1. Generate a new sheet under user-specified constraints, which includes a set of boundary edges determining the boundary position of the new sheet and a set of hexahedra delimiting the local region where the new sheet can propagate;
2. Generate complex sheets that intersect themselves more than once;
3. Guarantee the mesh quality by providing a chord-based optimization method for quad set.

**Closest prior art**

*Chen, J., Gao, S., & Zhu, H. (2015). An improved hexahedral mesh matching algorithm. Engineering with Computers. doi:10.1007/s00366-015-0414-1*. Accepted.

The differences between the prior paper and this new paper are:

1. The approach in the prior paper can only generate sheets that intersect themselves 0 or 1 time, while it can generate sheets that intersect themselves multiple times in the new paper;
2. The optimization method for quad set in the prior paper is too primary to guarantee the mesh quality, while we provide new optimization method based on the dual-structure of the quad set in this new paper that can guarantee the mesh quality.