Review Form

Paper No: ???

Title: Interactive Deformation of 3D Mesh Models

Evaluation
[ ] Excellent
[ ] Good
[x] Marginal
[ ] Poor

Recommendation
[ ] Reject
[ ] Poster presentation only
[x] Application/problem category
[ ] Presentation only
[ ] Proceedings quality
[ ] Journal quality
[ ] Award quality (candidate for best paper award)

Significance
[ ] Important problem of current interest
[ ] Part of a problem of current interest
[ ] The solution is a significant contribution
[x] An interesting insight
[ ] Recreational

Soundness
[x] Technically sound
[ ] Contains errors of detail (please explain)
[ ] Seriously flawed (please explain)

Comprehensibility
[x] Understood at first reading
[ ] Several readings required
[ ] It would take a long time to understand this paper

Presentation
[ ] Title is not appropriate
[ ] Abstract is not appropriate
[ ] Poor figures
[ ] Paper is too short/long
[ ] Rearrangements needed (please explain)

DETAILED COMMENTS

This paper proposes a deformation framework for 3D mesh models. The vertices of a 3D mesh model are classified into boundary vertices and interior vertices. During the deformation, different constraints are constructed for boundary and interior vertices separately. For each interior vertex, a mean value coordinate constraint is assigned, where the mean value coordinate with respect to a local volume is computed. For the boundary vertices, mean curvature constraints, positional constraints

and form-feature constraints are defined as those shown in one authors' published paper. All the constraints are in linear forms and can be solved using linear system solver.

The new idea of this paper is to construct the mean value coordinates constraints for interior vertices of the 3D mesh. These constraints are to keep the mean value coordinate with respect to a local volume for each interior vertex unchanged as much as possible during the deformation. The deformation constraints for boundary vertices are adopted from one authors' previous paper. The authors construct such constraints for interior vertices, but give very little convinced arguments about why such constraints work well and what problems they bring. One interesting question is how this method works when we just want to deform a part of the 3D mesh, like moving one leg of a horse. Furthermore, if we want to fix one part of the 3D mesh model including some interior vertices, I think this method will fail because this method define the fixed region as the surface-based mesh deformation which only uses the boundary vertices on the 3D mesh.

Examples in this paper show some validness of this method. However, this method is far away from soundness. The authors do not present more convinced argument about the efficiency of its method and do not demonstrate the weakness of its method, like whether it works on above cases. These deficiencies make the paper less exiting and creative.

There two suggestions on the paper writing. 1) The authors should give clear explanation of what the u_i is in equation 3.3 on page 5. I didn't see any explanation for u_i in the paper; 2) It is better to add a figure to illustrate what the angles α_{ij} and β_{ij} are in the equation 3.1;

After these considerations, my evaluation for this paper is only at marginal level.