KeyPoints

1 [Summary Review] **A quantitative evaluation of the accuracy** and **a comparison with the alternative slower k nearest neighbor graph methods**.

[Review 1] If this method has any advantages over the existing kNNG methods other than query runtime performance. In Table 1, there is no similar comparison of matching error, such as in Table 3. There is also no comment in the paper about accuracy improvements.

[Review 3] The "RC-kNNG Retrieval Performance" doesn't explain whether the alternative indexing structures retrieve the same parts.

**Response:** I plane to perform experiments to quantitative evaluate the accuracy among the 4 methods in Table 1.

**[I do not understand what does “a comparison with the alternative slower k nearest neighbor graph methods”(Summary Review) mean!]**

2 [Summary Review] **A comparison to simply segmenting the database**.

[Review 3] The primary weakness is a missing evaluation of the fundamental premise. The premise of the approach is that the example database becomes larger by implicitly containing all possible segmented parts. This is interesting and a worthwhile idea, but it is unevaluated. **Why not simply run segmentation on the database during preprocessing**? Then any of the approaches mentioned in the related work (sketch-based or 3D shape-based) which retrieve similar entire shapes from a database could be compared to. Can users no longer find the sub-parts they are looking for?

**Response:** Our method could be used in many applications. **I wonder in which application we should make comparison with the pre-segmented approach?** If any application is ok, I would like to choose the application of “part suggestion”. Because our method could obviously outperform the “pre-segmentation” approach in that application.

3 [Review 2] In the result figures, the retrieved results are not very similar to the sketches. This can be good or bad. In the good case, no great matches are available in the system and the system does a good job in retrieving the best available matches. In this case that indicates robustness. In the bad case, there would be many similar or better retrieval candidates that the system fails to identify. How can I tell? Therefore, the traditional evaluation of retrieval problems uses quantitative metrics, e.g. precision, recall, F-score, precision-recall curves, average precision, ... and a comparison of these metrics to competing algorithms. **This submission does not provide quantitative results of the quality of the retrieval.**

**Response:** We have provided the quality of the retrieval in Table 3. **I do not think we have enough time to perform the traditional evaluation of retrieval problems and make comparison of these metrics to competing algorithms suggested in this comment.** Is it acceptable not to add the evaluation and make comparison suggested in this comment?

4 [Review 2] **More retrieval results could be presented.** Instead of showing more retrieval results, the paper contains very rough sketches of quite adventerous applications. I understand that other papers follow the same template, but the underlaying strategy is to replace quality with quantity.

**Response:** I plan to add one example for each of the applications: “Sketch-driven assembly-based modeling”, “Contour-driven shape completion”, “Shape variation”, “part suggestion”, and “Symmetry-aware selection and editing”.

5 [Review 4] **missing discussion of choice number and location of camera views needed**. This seems to be a key issue, and would seem to depend on the types of objects in the data base.

**Response:** I plan to do experiments with different camera views:

1. 7 views (Same as [SXY∗11]): 3 canonical views (front, side, and top), 4 corner views from the top corner of its bounding cube.
2. 13 views (Same as [FMK∗03]): 3 canonical views (front, side, and top), 4 corner views from the top corner of its bounding cube, and the middle of six edges of a cube (tilt views).
3. 114 views (Same as “Fan L, Wang R, Xu L, et al. Modeling by Drawing with Shadow Guidance[J]. Computer Graphics Forum, 2013, 32(7):157–166”): 100 uniformly sampled views, 6 canonical side views and 8 corner views.

6 [Review 4] There are examples of results for a user sketch, but it is not clear whether this is just a sample “user sketch” made by one of the authors. Similar to FKS04, a **compelling test would be to give the user something specific to design from pieces of objects in the database**.

**Response:** I plan to add one example: Given the concept design (a photo), the user draw sketches (tracing the contour of the object in the photo). The 3D parts are retrieved through our method. Finally the object in the photo is resembled by the retrieved parts.

7 [Review 4] In the example applications, the ideas are interesting, but **the pose of the partial shape used for computing the boundary contours appear carefully selected**.

**Response: I am not sure what does “the pose of the partial shape” refer to!**

Does it mean the pose of the lamp in figure 10?

8 [Review 3] Does the proposed approach work on a different database than the one it was developed with?

**Response:** I plan to clarify this point as follows:

“I develop the approach on a database including 43 shapes from different categories. The database is then extended to 513 shapes when we do experiments and generate examples.”

9 [Review 1] **Why the descriptor as described in sec 5.1 is invariant to the index ordering of the contour polylines**. IE, for two contours, the descriptor only makes sense if the (i,j) indices of the matrix refer to points in comparable relative spatial locations. In other words, where does 'i' start on each polyline?

[Review 3] **Are contours sampled uniformly from directions around the unit sphere** (Section 4, third paragraph)?

**Response:**  I plan to revise the text as follows:

“The contours are sampled from the counter-clockwise direction around the unit sphere. In each section, ‘i’is the first sampling point in the sense of counter-clockwise direction.”

10 [Review 2] **The partial shape matching problem is not well specified**. It is difficult to define a metric that computes the quality of partial matches and it is already difficult to get humans to agree on what partial matches are good or not. This is a general problem, also for other methods in this area, but I feel it could have been tackled a bit better.

**Response:** Does this comment ask us to give the partial shape matching problem an formal definition?

[Review 1] Fig 12 shows a global symmetry example. **Would local symmetry/similarity matching also be possible**?

**Response:** I plan to add an example showing the local symmetry matching.

12 [Review 4] the extreme simplicity of the partial shapes used. In a significant database an extraordinarily large number of partial geometries could match the very simple sketches used here.

**Response:** I plan to revise the text as follows:

“The contextual information could be adopted to assist our partial matching algorithm. We leave this for the future.”

13 [Review 4] the very small size of the data based searched. There are obviously larger data sets available, making it seem suspicious that this doesn’t scale well.

**Response:** Our RCKNNG is designed to deal with the large database.