

REVIEW COMMENTS for *Integration of Feature Based Design and Feature Recognition*.

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OVERVIEW OF THE PAPER

In this paper, the Object Oriented Feature Finder 2 (OOFF2) system is described. OOFF2 serves as a tool for the integration of both solid modeling and design by feature modeling as well as an automatic feature extractor. Moreover, OOFF2 provides a mechanism for the generation of multiple interpretations of a part model upon request. OOFF2 is an extension of OOFF, another feature extractor, with more powerful hint generation engine along with a more complete control mechanism.

COMMENTS TO THE AUTHORS

1. The literature review is a strong point of this paper. The previous works referenced provide a good coverage of the relevant state of the art. The important concepts are summarized with sufficient detail and analysis.
2. The contributions of this paper, as taken from both the introduction and conclusion, are:
 - A feature recognizing mechanism that allows input from both a solid model and a design by feature model.
 - A feature recognizing mechanism that utilizes information from both of the above models for the generation of hints about features.
 - A feature hint mechanism that ranks possible features according to a novel set of criteria based on certainty factors.
 - The ability to generate alternative interpretations upon request.

The first two contributions are covered accurately, and in sufficient detail, however, the last two are lacking in their coverage. Specifically, the hint ranking mechanism is covered in section 4. The theory behind certainty factors is covered and referenced sufficiently, but the actual application needs some expansion. For the example given on page 14, a $CF = 0.3$ is originally chosen arbitrarily. It is stated that this value is unimportant, however it would seem that a $CF = 1$ or -1 might have adverse consequences. It is clear that an original $CF = 0.35$ would produce the same results, but it seems far from arbitrary. More importantly however, no methodology is presented that would produce the certainty factors presented in the example. The example helps to clarify the idea of hint ranking, but without the presentation of a formal mechanism for the generation of the certainty factors, it leaves the impression that the method is ad-hoc and the example is contrived.

The alternative interpretation ability is also not sufficiently covered. Section 5.3 covers the multiple interpretation mechanism. Again the same problem with the hint ranking description shows up here. An example is provided that explains how the multiple interpretations are generated for a given part, but no methodology is presented. On page 21 it is stated that if a new interpretation is requested, OOFF2 takes this as *user advice* and accordingly ranks the hints so that the new interpretation is given. However, in the diagram of OOFF2 on page 17, there is no reference to how *user advice* interacts with the hint manager. Also, again it would be helpful to describe a formal method for the new hint ranking.

In conclusion, both of these sections need a formal description of the actual theory used in the research. Certainly the examples provided came about from a general method, but only the background for this general method is provided. The examples are clear, but not sufficient.

3. The language, organization and grammar of the paper are clear. A few specific typos are noted below:

- The last word in the abstract should be "request."
- On page 6 in the top paragraph, the word precedence should be precedence.
- In figure 5, the hint (f2,f4) has a period instead of a comma.
- On page 3, "As" after etc. in the second paragraph should be "as."
- On the bottom of page 8, "pockets and slot...", should be "pockets and a slot..."
- On page 19 "willincur" needs a space.

OVERALL IMPRESSION

Despite the lack of a sufficient description of the hint generator and the multiple interpretation procedure, the paper is otherwise well organized and presents a novel solution to the defined problem. The paper is well documented, and the examples and figures offer clear insight into the ideas. With a formal methodology added to some of the examples, the paper would accomplish all of the goals that is sets forth in its introduction.