First thank you for your hard work in reviewing this paper. I find the review comments are very helpful, and I have taken these comments into consideration, and polish my paper significantly.

According to the TODAES new pages limit, I shrink my paper from 30 pages to 25pages in the following way:

1 in Section 8 “RELATED PUBLICATIONS”, I remove the two subsections “Protocol converter synthesis” and “Logic synthesis with Craig interpolation” as their relevance are somewhat relative low.

2 I also rephrase many paragraphs without removing them, such that they occupy less space.

I present below the reviewer comments in BLUE color, and my response in RED color.

---------- REVIEWER COMMENTS ----------

Referee: 1

Comments to the Author
The revision addressed most of my comments. Thank you. However, there are several minor clarifications needed.

1. Regarding the over-approximation issue of interpolants, you commented “in the special case that A and B are complement to each other, that is, every assignment must satisfy either A or B but not both, then this interpolation must cover and only cover A.” Please explain why A and B have to be complementary to each other in your formulas. Essentially why there is no assignment a* under which R(a*, b, 0) and R(a*, b, 1) are both unsatisfiable? That is, why should R(a, b, t) be satisfiable under any assignment on variable a?

You are right, I have not described it clearly here.
Actually this is an assumption for this algorithm. It will NOT be fulfilled by the algorithm itself, but instead should be fulfilled by the actual application of the algorithm.
So I add three paragraph in page 9, subsection 4.1, the 2nd to 4th paragraphs:
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(1) Assumption 1 : R(a, b, 0) ∧ R(a, b, 1) is unsatisfiable. a and b are respectively called the important and the non-important variable vectors, t is the target variable.
(2) Assumption 2 : R(a, b, t) is satisfiable for all valuations of a.
In the remainder of this paper, when we use the algorithm introduced in this subsection, we will show that these two assumptions are fulfilled.
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In page 11, paragraph 3 starting with “That is” , this is the first application of the algorithm, we described how the two assumptions are fulfilled.
In page 12, paragraph 3 starting with “Obviously”, this is the second application of the algorithm, we describe how the two assumptions are fulfilled.

2. In (9), “d_{p+l} \neq d’_{p+l}”. You use “\neq” instead of “\not \equiv”. Please clarify whether “\neq” means nonequivalence in some bit or bitwise nonequivalence.

You are right, I have not described it clearly here.
On page 10, subsubsection 4.2.1, paragraph 2 starting with “Here,”, we have clarified that \neq means nonequivalence in some bit.

3. In page 2, “d can not be uniquely by…” -> “d can not be uniquely determined by…”; “d is not need by…” -> “d is not needed by…”; “can be any value” -> “can be of any value”

Thank you, I have changed it according to your suggestion.

4. In page 4, “it use…” -> “it uses…”

Thank you, I have changed it according to your suggestion. I also change some other similar typos.

5. In page 5, “p,l” -> “p, l”. There are many other places where space separation is missing.
Thank you, I have changed it according to your suggestion. I also change some other similar typos.

6. In page 5, “They can always be satisfiable with…” -> “They can always be satisfied with …”
Thank you, I have changed it according to your suggestion.

7. The first sentence of page 6 can be merged with the last paragraph of page 5.
Thank you, I have changed it according to your suggestion.

8. In page 6, “Second and more important,” -> “Second, and more importantly,”
Thank you, I have changed it according to your suggestion.

9. It is not clear which paper in references is referred to by the citation “[Jie-Hong Roland Jiang 2009]”.
Thank you, there is a typo in the bib file, I have corrected it.

10. The relevance of [Wu et al. 2010] to the paper is not well described. Please either describe ECO in detail or remove it if the relevance is low.

Thank you, you are right. I have remove it.

Referee: 2

Comments to the Author
thanks for the effort in revising.