IEEE Computer Architecture Letters

Decision Letter (CAL-2020-02-0017)

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Subject: Decision: Manuscript CAL-2020-02-0017 - IEEE Computer Architecture Letters

Body: Dear Dr. Chu:

Manuscript CAL-2020-02-0017 entitled "A High-Performance Design of Generalized Pipeline Cellular Array" which you submitted to the IEEE Computer Architecture Letters, has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

The reviewer(s) have recommended publication, subject to some minor revisions to your manuscript. Therefore, we invite you to respond to the reviewer(s)' comments and revise your manuscript.

To revise your manuscript, log into https://mc.manuscriptcentral.com/cal and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

Please be sure to include an appendix indicating how you have addressed each of the editor's and reviewer(s)' comments. We prefer an appendix for this purpose, included at the end of your manuscript, instead of a separate document. In order to expedite the processing of the revised manuscript, please be as specific as possible in your responses.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center. IMPORTANT: Please submit camera-ready copy. You must use the Computer Architecture Letters template, available at https://www.computer.org/publications/author-resources/peer-review/journals#templates.

Unlike typical IEEE transactions, your names and affiliations should both appear in the masthead ("conference style"). Please also be sure that table captions appear above tables, and that the bibliography is in alphabetical order. Finally, as a footnote at the bottom of the first column on pg. 1, please put "Manuscript submitted: 29-Oct-2019. Manuscript accepted: 31-Mar-2020. Final manuscript received: XYZ" (where XYZ is the date you send us camera-ready copy).

Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

Because we are trying to facilitate timely publication of manuscripts submitted to the IEEE Computer Architecture Letters, your revised manuscript should be submitted within 7 days. If it is not possible for you to submit your revision in a reasonable amount of time, we may have to consider your paper as a new submission.

Once again, thank you for submitting your manuscript to the IEEE Computer Architecture Letters and we look forward to receiving your revision.

Sincerely,

IEEE Computer Architecture Letters Editorial Office

Associate Editor
Comments to the Author:
Thanks for addressing reviewers' comments. There are a few more minor suggestions. Please consider addressing them.

Reviewer(s)' Comments:

Reviewer: 1

Recommendation: Minor Revision

Comments:
(There are no comments. Please check to see if comments were included as a file attachment with this

e-mail or as an attachment in your Author Center.)

Additional Questions:
1. Confidence in your review: Medium

2. What is the important insight or idea that this paper contributes?: This paper develops a new QCA AU and CU cells with logic gates that lead to a denser, and faster GPCA design. By using different gates, the authors minimize both wire crossings, as well as critical path latency.

3. What is the potential impact of this paper?: This paper presents a higher performance, and more practical design of AU and CU elements. These elements compose to build a GPCA architecture. The impact would be a new state-of-the-art design of these components and perhaps lead to higher performance, practical implementations of GPCAs.

4. Is the manuscript technically sound? Please explain your answer in the "revisions" or "comments for the authors" sections below.: Appears to be – but didn't check completely

5. What revisions do you suggest for the paper?: The weakest part of this paper was the simulation results shown in Figure 5 and explained at the end of Section 5. It's difficult to understand what each line is and what the image (waveform?) is. I'm missing a "point" here. What is the reader supposed to learn from this image? What point are you trying to make?

6. Other comments for the authors: This version of the paper is much improved over the prior submission. Space was used much more efficiently, and the ideas and optimizations were explained with much more detail and were easier to understand.

Reviewer: 2

Recommendation: Accept

Comments:
(There are no comments. Please check to see if comments were included as a file attachment with this e-mail or as an attachment in your Author Center.)

Additional Questions:
1. Confidence in your review: Medium

2. What is the important insight or idea that this paper contributes?:

3. What is the potential impact of this paper?:

4. Is the manuscript technically sound? Please explain your answer in the "revisions" or "comments for the authors" sections below.: Appears to be – but didn't check completely

5. What revisions do you suggest for the paper?:

6. Other comments for the authors:

Reviewer: 3

Recommendation: Minor Revision

Comments:
(There are no comments. Please check to see if comments were included as a file attachment with this e-mail or as an attachment in your Author Center.)

Additional Questions:
1. Confidence in your review: High

2. What is the important insight or idea that this paper contributes?: This paper proposed a new method for efficient hardware implementation of quantum-dot cellular automata.

3. What is the potential impact of this paper?:

4. Is the manuscript technically sound? Please explain your answer in the "revisions" or "comments for the authors" sections below.: Yes

5. What revisions do you suggest for the paper?: This paper proposed a new method for efficient hardware implementation of quantum-dot cellular automata. Compare to the previous version, authors have made significant changes to the paper. The paper is much better organized and motivated. I still have the following minor comments on the paper:
1- The authors need to narrow down the application and use cases of the new QCA. Based on the current motivation, it seems that the design benefit is quite broad. However, I believe there are several cases that area overhead becomes more important than efficiency, e.g. embedded devices.
2- I have some doubts about the explanation of Table 3 in the text. I am not sure if the average improvement really makes sense here. Also, authors need to make sure the baseline is state-of-the-

art.

6. Other comments for the authors:

Date Sent: 31-Mar-2020

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