

## Peer Review

# Review of: "Towards End-to-End Neuromorphic Voxel-based 3D Object Reconstruction Without Physical Priors"

Michael Hawks<sup>1</sup>

1. Engineering Physics, Air Force Institute of Technology, United States

I liked your point about the speed difference enabled by the neuromorphic sensor – I look forward to seeing more quantitative comparisons of that issue.

Presenting the threshold selection as a “Principle” or a major contribution seems spurious to me, however. If I can be slightly reductive to make a point, you define the threshold based on maximizing the same metrics you use to decide if your method is doing a good job -- failure is impossible by definition. Does choosing a threshold in this way provide any insight about the method, or reduce computation time? What is the benefit (aside from ensuring that the methods are getting a fair comparison)?

Aside from that, I think this is a well-written paper with interesting results. I think there are a couple of things you could add to make your message stronger, however.

First, the abstract claims your method eliminates the need for physical priors, but that point doesn't really come through clearly in the results and conclusion. It may be simply a matter of emphasizing the details of how your data was collected--does that dataset include IMU data, for example? Was the experiment really free of any sort of physical prior data?

Secondly, (if I'm understanding this correctly) all your training and testing data featured “well-behaved” objects with clean edges, isolated from any background clutter. Can you comment on how this method might scale to less controlled scenes?

Minor editorial notes:

\* Equation (1) defines the size of the convolution using a and b, but the paragraph below uses m and n.

\* Figure 1 might give more insight if you also show the event frame prior to Sobel filtering for comparison.

- \* Sorry, but I'm not familiar with the options authors have on this site. Is there a way to make Figures 2 and 3 bigger? They are very difficult to read.
- \* Section IV.B, paragraph 2: missing space between "frame" and "using".
- \* Table V - the column formatting is slightly misleading.

## **Declarations**

**Potential competing interests:** No potential competing interests to declare.