

General Comments

I thought this draft did a good job getting most of the ideas down, and usually if there was something I was confused about I could read back over and find an explanation. Some of the edits I suggest are cases where references to explanations could be made more explicit. There are also cases where a section as a whole could be reorganized to make the ideas easier to follow.

Specific Comments

section 3, line 2

This refers to “aforementioned feature statistics”. I think it would be helpful to be explicit about where these are described or even to list some of them again.

section 3, line 6

This paragraph starts by mentioning challenges, then gives high-level descriptions of two different techniques for solving the problem. When I read this I felt a bit surprised to be immediately confronted with challenges but also a bit overwhelmed by the amount of content in the paragraph. I think it might be helpful to reorganize this into three smaller paragraphs, first describing an initial attempt at a solution, then challenges/drawbacks, then refinements to the method to address those challenges. I think this would better fit my expectations as a reader and also help break the material down into more consumable chunks.

section 3.1, line 1

The paragraph starts with “As mentioned above”. I think it would again be helpful to be more explicit about the location, but the start of the sentence/paragraph should also emphasize what exactly is the topic. I think you could simply switch the first two sentences and it would be an improvement.

section 3.1, line 4

The sentence “Thanks to some properties...” seems like a scaffolding sentence. I’m not sure it adds anything.

section 3.2.1

This section could use a topic sentence instead of jumping into the explanation. Maybe something like “The observed light wavelengths can be used to sort galaxies into redshift bins.” Additionally, the end of the section refers to “the following table,” where it would be more helpful to say “table 3”.

section 3.2.2

The section title suggests that it’s about comparing redshift bins, but the section doesn’t actually seem to talk about how this is done. It seems like you could actually just combine this with the discussion of hypothesis testing for differences, since they’re both just about seeing whether the conditional feature distributions are different between bins.

section 3.2.3, line 2

This might not be really a structural issue, but to say that we use a significance test “to see whether effects ... are significant” seems somewhat redundant or otherwise not helpful. I think this could instead be described as something like “to see whether differences in observations are simply a result of random noise”.

section 3.3.4, line 4

The Y in (z^*, Y) pairs is unexplained. I think this refers to the feature statistics that describe morphology, but it would be helpful to be explicit.

section 3.3.4, lines 5-7

I think the two sentences (“The distribution function.... So the method...”) describing why we use the mode could be reorganized using the idea of *old information to new information*. Instead you could write something “We use the mode because the estimated distribution function for redshift is less reliable at other points.”

section 3.3.4, line 8

The sentence “We will pay attention to...” seems to suddenly introduce a new idea (multi-modality), but perhaps you could link it to the rest of the paragraph by saying something like “This technique for estimating redshift faces difficulties for galaxies with multi-modal probability distributions. This problem will receive particular attention.”

section 3.3.5

I found the organization of this section confusing. It presents the test statistic before explaining what the components are. It also never says what the null distribution of the test statistic is. I think it would easier to follow to (after stating the test hypotheses) give the formula for $\hat{\lambda}$ and explain it, then give the test statistic and explain how $SE(\lambda)$ is obtained, then give the null distribution and the intuitive explanation for how the test works.