

General comments:

1. There is an extensive use of the word “features” related the DWT. What exactly does this mean?
2. Overall Accuracy (unused terminology, actually it is prediction accuracy): This is probably not the best metric to evaluate ML algorithms when the classes are not balanced. Could you provide for instance directly the confusion matrix, it provides all the info about the classification results. Same thing for the Average Accuracy. Maybe AA could be improved by taking into account the Weighted Average Accuracy.
3. K-coefficient: What do you mean with this coefficient? I cannot find it even in ref. 35. Did you mean the Cohen’s K-coefficient? But it takes values between 0 and 1.
4. A 60:40 ratio is a very challenging value to divide the data set. The results of the ML classifiers you show in Tab. 2 and Tab. 4 are relative to the test set or training set? If they are relative to the test set you have obtained a very robust method.
5. Figs 9 and 11 are difficult to read.

Here’s the specific comments, suggested corrections and typos.

Row 10: “area of research” → “research area”.

Row 12: “that enable the researchers to develop algorithms” → “that enable the development of algorithms”

Row 16: “extracting spectral resolution of the hyperspectral data” → “extracting the spectral content”

Rows 16-20: I suggest to invert the order of the period starting at Row 16 with the subsequent one. At row 17 you introduce “classifiers” without specifying nothing else before that point, it is not so clear

Row 21: “From the experiments” → “”

Row 21: “was observed” → “has been observed”

Row 23: “state of art” → “the state of art” (in some places state of art, in others state-of-the-art, check coherence)

Row 24: “which is 11.2%” → “11.2%” this is the difference between the percentages, not the (relative) percentage of the difference (14.5%). Same consideration at row 306.

Row 27: “machine” → “Machine”

Row 33: “earth” → “Earth”

Rows 34-37: many described features in a small space. Consider to slightly extend and merge them better.

Rows 43: “data” → “images”

Row 43: “DWT” → “Discrete Wavelet Transform”. Is the first time that it is mentioned in the text

Row 45-46: “et.al.” → “et al.”

Row 47: “the better”. It depends on the meaning. “The best”?, “a better/an improved”?

Row 47: “image” → “images”

Row 49: “as:” → “as”

Row 51: “de-pendent” → “dependent”

Row 54: “images” → “image compression”

Row 59: “lack” → “the lack”

Row 62: “Lower” → “A lower”

Row 63: “are minimized” → “is minimized”

Row 64: "dual tree" → "dual-tree"

Row 76: "using" → "using a/the"

Row 77: "SVM" → "Support Vector Machine". Is the first time that it is mentioned in the text

Row 79: "Remaining work" → "The remaining work", "The rest of the work"

Row 83: "with hundreds" → "with the use of hundreds" "

Row 90: "Second". You miss "First" or something similar

Row 91: "the issue of" → ""

Row 91: "costly image marking cost" → "high cost of image marking"?

Row 113: "for this" → "for a"

Row 117: "can be used to efficiently solve this problem" → "can efficiently solve this problem"

Row 121: "achieve" → "to achieve"

Row 130: "to produce" → "to extract"

Row 133: "model has local" → "the model has a"

Row 134: "are more likely to belong" → "likely belong"

Row 135: "In addition, the spatial 3D-DWT function primarily incorporates SVM". Please explain further. Is SVM contained in 3D-DWT?

Row 143: "datasets" → "data sets"

Row 144: "Hyperspectral" → "A hyperspectral"

Row 146: "and it produces" → "producing"

Row 148: "the properties like" → "properties like" or "the properties as"

Row 148-149: Please rephrase

Row 154: "down sampled" → "downsampled"

Row 155: "Decision Tree"??? did you mean "Random Forest"? They have the same approach but are also fairly different

Fig. 1: "DATASETS" → "DATA SETS". In the caption: why all capitalized?

Row 161: "nomenclatures" → "the terminologies" "procedure" → "the procedure"

Row 164: "entire" → "the entire"

Row 165: "b * n" b is not defined

Row 166: "w" → "w" "&" → "and"

Row 167: "a best" → "the best" or "a better"

Row 167-168 "spectrum" → "spectrum of applications"

Row 170: "where," → "where"

Row 175: "multistage" → "a multistage"

Row 177: "the equation" → "equation"

Row 189: "filter either low or high pass coefficients" → "low or high pass filter coefficients"

Row 192: "which is shown" → ", as "

Figure 2: The first two periods of the figure caption are unessential here. Some typos in the diagram. I'm not sure about the diagram, typically the next transformation level is applied to the LLL cube. Is your schema different of the figure is not correct?

Row 200 and 203 "sub band" → "sub-band"

Row 208: "The algorithms". Which ones?? Did you mean "This algorithm". I think the incipit of this section can be further expanded.

Row 209: "with following steps" → "with the following steps".

Row 211: "partial features". This does not make much sense. Did you mean: "a portion of features" or "a partial feature selection".

Row 212: "feature" → "features"

Row 213: "performance" → "the performance"

Row 214: "issue" → "issue,"

Rows 214-228: KNN explanation: It is not clear (or even not specified at all) how many "neighbors" do you consider for your application, and why.

Row 216: "letters as training vectors" → "..as training labels"???

Row 219: "Consider" → "Considering" or "Let us consider"

Row 220: "The aim of the algorithm is" → "The algorithm aims"

Row 227: "timing better compared to" → "timing is better than"

Fig. 3: It is too small. It misses axis labels. It is easily possible to further develop the image by tracking lines with the "nearest neighbors"

Row 231: "look" → "looks"

Rows 231-232: Actually SVM is able to make also multi-classes classification. The concept can be clarified by using "for example in binary classification SVM..."

Row 232: "perception": Did you mean "perceptron"?

Row 234: "with a help" → "with the help"

Row 234: "divides labels". Probably it is more appropriate "divides samples/data/points"

Row 234: "hyperplane" → "a hyperplane / hyperplanes"

Row 237: "get perfect margin". Perfect margin is "largest margin", i.e. the hyperplane which maximize the distance with the nearest points

Row 238: "If "y" is positive with a largest possible value then it is predicted as separate class.". I cannot understand this sentence. Could you explain better or rephrase it? The number of class in supervised SVM is prescribed so it cannot add more classes.

Row 238: "a largest possible" → "the largest possible"???

Rows 241-242: "reduce the misclassification problem, which is shown in equation 8". The epsilon parameter is an optimization parameter for SVM, it allows to handle with noisy or non-linearly separable data. Moreover, how can the equation 8 shows a misclassification problem?

Eq. 9: - It misses "y" in front of bracket.
- $\epsilon_1 \rightarrow \epsilon_i$

Row 244: "wrong" $\rightarrow$ "a wrong"

Rows 245-246: "The values of epsilon between 0 and 1 indicate that the classes are right side of the separating plane, else it entered the margin". I cannot understand this sentence. If the values of epsilon are between 0 and 1 the classification is correct but the points fall within the margin.

Row 247: "in the other side of the hyperplane". Maybe better "in the WRONG side of the SEPARATING hyperplane".

Row 248: "SVM classification" $\rightarrow$ "ML classification algorithms". Because actually you use 3 different algorithm which indeed are depicted in Fig. 4

Row 254: " $R^{(w \cdot h \cdot 15\lambda)}$ " $\rightarrow$ " $R^{(w \cdot h \cdot 15)}$ "

Row 255: "Certain" $\rightarrow$ "A certain"

Row 261: "Methodology" $\rightarrow$ "Results and discussion"

Rows 264-265: "The results are compared with several methods including...". Maybe better: "The results are compared with the same classifiers but without using information from the DWT."

Row 270: "AA gives the" $\rightarrow$ "AA provides"

Row 272: "as shown in equation 10" $\rightarrow$ ", as shown in equation 10,"

Row 277: "where," $\rightarrow$ "where"

Eq. 12: m_{ii} is not defined.

Row 282: "are represents" $\rightarrow$ "represent"

Row 289: "as shown" $\rightarrow$ ", as shown"

Fig. 7: Into the caption: "Data" $\rightarrow$ "data"
"ROI" First time used, maybe is better define the acronym

Rows 295-299: The same period is repeated identically in rows 342-346. Maybe it could be summarized elsewhere (e.g. "Methodology"???)

- Why 15 features (is a magic number)?

- "The algorithm requires 20 epochs for training". Which algorithm? What did you mean with "epochs"? The number of epoch does not make sense for any of the algorithm adopted in the work (PCA, RF, SVM and KNN).

- "Several important parameters..". rephrase this period, because if they are important parameters why they are not specified?

Row 305: "As shown in Table 2, 6132 training samples...". In Table 2 I see the results and I cannot read the number of samples (Did you mean Tab. 1?)

Row 307: "is more" $\rightarrow$ "are more"

Rows 312-313: "of the coefficients of the wavelets" $\rightarrow$ "of the wavelet coefficients"

Tab. 2: Probably the "class" column could be clearer if its values would be the same of Tab. 1.

Row 328: "60: 40 ratios are" $\rightarrow$ "60:40 ratio is"

Rows 328-331: The same period is repeated at rows 370-372. Maybe it could be summarized elsewhere (e.g. "Methodology").

Row 329: "like," → "like"

Row 331: "figure 10" → "figure 9" Consider that Fig. 9 is not referred in the text.

Row 338: "year of" → "year"

Rows 341-342: This concept was already explained...also many times.

Table 3: the table contains a negative value in the Training dataset column

Table 4: Same as Tab. 2

Rows 350-352: "Copy and paste" of rows 300-302. More in general different points in Section 4.1 and 4.2 are exactly the same, maybe they can be rephrased.

Rows 350-352: "Classification results of all the challenging methods on ground truth of Salinas Scene Hyperspectral Data is shown in figure 10 and the overall accuracy, average accuracy and kappa coefficients are reported and compared in Table 4." → "Classification results of all the challenging methods on the ground truth of Salinas Scene Hyperspectral Data are shown in figure 10. The overall accuracy, average accuracy and kappa coefficients are reported and compared in Table 4."

Rows 356-357: "As shown in Table 4, here 159206 samples from Salinas Scene Hyperspectral Dataset were selected for training." → "Table 4 shows that 159206 samples from Salinas Scene Hyperspectral Dataset were selected for training." (Tab.4 does not show the number of training samples. Did you mean Tab.3?)

Row 359: Is misleading. It looks like the caption of Fig. 10, maybe the figure can be placed in a better point (top/bottom).

Row 382: "to state of art" → "to the state of the art" or "to the state-of-art" (again, check the coherence in the text)