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Donostia, 1 July 2022

Professor Dianne Cook, Editor-in-Chief, R Journal

Dear Prof. Dianne Cook,

We are very pleased with the good comments received from reviewers regarding our article RJournal 2021-125 entitled "dbcsp: User-friendly R package for Distance-Based Common Spatial Patterns". Below we include our responses (blue color) to their minor remarks; changes are also marked in red in the revised version of the manuscript. The package itself with the update (dbcsp_0.0.2.1) is in CRAN.

Looking forward to hearing from you.

Sincerely,

I. Irigoien
on behalf of all the authors

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Reviewer 1

In this revised manuscript and the updated package, the authors addressed most of my concerns on the previous version.

I have two follow-up comments.

1. On Page 7, the authors stated “However, it is evident that it may be of interest to use other classifiers or other characteristics in addition to or different from log-variances. This more advanced procedure is explained below.” However, from the usage of the function “predict" provided by the authors, it is still unclear to me how to use “other classifiers”. It would be helpful if the authors provide a bit more details. For example, if I would like use the random forest as the classifier. How to implement it?

> In section “Extending the example” there is an example of how to implement a Random Forest (page13), and function `predict` is also used but on a `caret` object. Nevertheless, being `predict` a generic function, its behavior is different depending on the input object. When `predict` is applied on a `dbcsp` object, the prediction is made on the Linear Discriminant Classifier (LDA). To apply other classifiers, `dbcsp` is used to compute the directions given by DB-CSP, that is, `dbcsp` is used to build the features in training and test sets that are given to the Random Forest classifier in `caret`. A comment is included in the original paper to clarify such use.

2. For the usages of “plot”, “boxplot”, “selectQ”, “train” and “predict”, the authors used “mydbcsp” as the input argument in the example code, but defined “object” in the argument lists. For example, “selectQ(mydbscp)” should be “selectQ(object = mydbscp)”? Similar to other function

> In the arguments list it is indicated that the first argument (`object`) must be an object of type `dbcsp`. In this case, the variable `mydbcsp` is defined as a `dbcsp` object so it can be used for that parameter. As you point out, the name of the argument can be indicated (in this case object) when calling the function, but it is not necessary as long as the order of your variables is correct, that is, the order must match with the one indicated in the definition of the function. Therefore, in this case it should work both ways since the object `mydbcsp` will be treated as the first argument of the list, which corresponds to the `dbcsp` object. You could call the function both ways:

- `dbcspselectQ(object=mydbcsp)`
- `selectQ(mydbcsp)`

Please note that in some of these functions definitions `x` is used as parameter name instead of `object`. This has been changed in the article as it did not match the code.

Reviewer 2

Overview

Overall, I found that the authors have sufficiently addressed all of my comments from the initial submission.

Article

The article is an improvement over the original submission. The text is better, and I was able to use the provided code to reproduce the figures.

Package

I appreciate the authors expanding the package to accommodate arbitrary distances. The provided code was simple to run, and allowed me to reproduce the paper. However, Line 39 in the provided code led to this warning on my machine:

```
> mydbcsp.dtw <- new('dbcsp', X1=x1, X2=x2, labels=c("C1",
"C2"), type="dtw")
Warning in (function (X, mixture, type, w, eig.tol = 1e-06,
getWarning = TRUE,  :
  Distance matrix was converted to be definite positive
Warning in (function (X, mixture, type, w, eig.tol = 1e-06,
getWarning = TRUE,  :
  Distance matrix was converted to be definite positive
```

It would be good if the authors can investigate this warning, in case this might lead to problems. For what it's worth, my version of R is 4.1.1, and I used version 0.0.2.0 of the dbcsp package.

> Actually it is a warning given by package `dbcsp` itsef if the minimum eigenvalue is below the tolerance set in `eig.tol`. In this case the covariance matrices are replaced by the most similar matrix that are positive definite and a warning was printed. The purpose of the warning was to make the user aware of it. Nevertheless, thanks to this comment we realize that the printed warning was not clear and it has been changed. A comment is also included in the original paper.