pdc-median – README

Software information

Path-difference and Cophenetic median tree (*pdc-median*) software is designated for computing phylogenetic median trees (supertrees) under the path-difference [2,3] and cophenetic [1] metrics.

The software is implemented in Java 1.8 and distributed as a jar file, `pdc-median.jar`.

Running pdc-median

To execute the median tree software one needs to have the Java 1.8 runtime installed. The software can be executed as follows:

```
java –jar pdc-median.jar <path to input trees> <output directory> <taxa per step> <# of restarts> [-M] –[C]
```

Required Arguments

<path to input trees>: a path to a NEXUS/NEWICK formatted file containing input trees that a user want to construct a median tree for.

<output directory>: a path to an output directory, where the computed median trees would be stored in separate NEXUS files.

<taxa per step>: a non-negative integer between 0 and 100 that controls the rate at which a starting tree for the local search heuristic is constructed. This argument specifies the number of taxa to be added to a partially constructed starting tree per stage. See parameter δ in [1].

<# of restarts>: a positive integer (less than or equal to 100) that indicates how many runs of a local search heuristic the user wants to perform. That is, how many output supertrees the user wants to obtain.

Optional Arguments

-M: indicates that the Manhattan (L1) norm should be used for computing the distances (typically slower than the default Euclidean L2 norm).

-C: Indicates that the cophenetic metric should be used for computation rather than the default path-difference metric.

Usage example

```
java –jar mmt.jar test-input/seabirds.tre ./seabird_supetrees/ 10 3 -C
```

Note that the `-C` switch in the end indicates that the cophenetic metric will be used.

The seabirds dataset is distributed along with the software.

References

[1] A. Markin and O. Eulenstein, “Cophenetic median trees”. Available online in the IEEE/ACM TCBB journal, 2018.

[2] A. Markin and O. Eulenstein, “Efficient Local Search for Euclidean Path-Difference Median Trees”. Available online in the IEEE/ACM TCBB journal, 2017.

[3] A. Markin and O. Eulenstein, “Computing Manhattan Path-Difference Median Trees: a Practical Local Search Approach”. Available online in the IEEE/ACM TCBB journal, 2017.