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Plain Language Summary: We compare the accuracy of five representative similarity metrics in extracting sea level pressure (SLP) patterns for accurate weather chart classification. We use a large amount of teacher data to statistically evaluate the accuracy of each metric. The evaluation results reveal that S1 and SSIM have the highest accuracy in terms of both average and maximum scores. Their accuracy does not change even when non-ideal data are used as the teacher data.

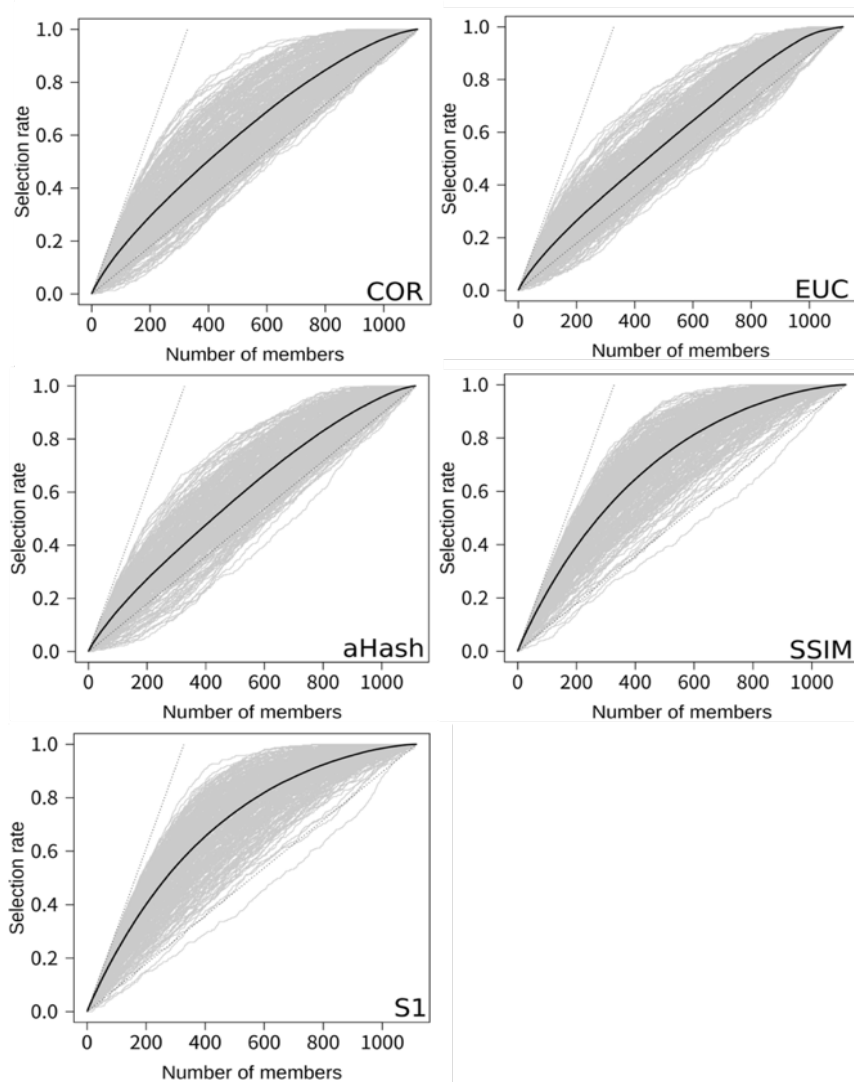


Fig. 1 Selection rate of similarity metrics. The horizontal axis is the data number to be selected (p in selection rate), and the vertical axis is the selection rate. The gray line represents the curve of teacher data, the black line is the mean curve of teacher data, the steep dotted line represents the ideal transition for the selection rate (all extracted data contains the CSoJ patterns), and the gentle dotted line represents the random transition of the extraction rate.

- The accuracy of five representative similarity metrics is compared in extracting sea level pressure (SLP) patterns using a large amount of teacher data.
- S1-score and SSIM have the highest accuracy and their accuracy does not change even when non-ideal teacher data are used.
- This study can serve as a reference for identifying the most useful similarity metric for the classification of SLP patterns, especially when using non-ideal teacher data.