Data set IVa (motor imagery, small training sets)

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Algorithm:

We use an ensemble classifier based on 3 methods including (1) common spatial pattern (CSP) algorithm on event-related desynchronization (ERD), (2) Autoregressive models (AR) algorithm on ERD, and (3) Linear discriminant analysis on temporal waves of readiness potential (RP). For subjects *al*, *aw*, and *ay*, only CSP method is applied; for subjects *aa* and *av*, 3 methods are combined. Bootstrap aggregation (bagging) is used to make the ultimate decisions.

For subjects *aw* (tr/te:56/224) and *ay* (tr/te:28/252), an adaptive approach by adopting former classified test samples as extended training samples has been used to classify the latter test samples session by session.

Reference:

[1]G. Dornhege, B. Blankertz, G. Curio, and K. R. Müller, "Boosting bit rates in noninvasive EEG single-trial classifications by feature combination and multiclass paradigms," IEEE Trans. Biomed. Eng. vol.51, no.6, pp.993-1002, 2004.

[2]Y. Wang, Z. Zhang, Y. Li, X. G, S. G and F. Y, "BCI Competition Data Set IV: an algorithm based on CSSD and FDA for classifying single trial EEG", IEEE Trans. Biomed. Eng., vol.51, no.6, pp.1081-1086, 2004.