

Directed Acyclic Graph SVM with Decision Value History Smoothing

David R. Hardoon, Charanpal Dhanjal and Zakria Hussain
University of Southampton
School of Electronics and Computer Science
Image, Speech and Intelligent Systems Research Group
Southampton, SO17 1BJ, UK
{drh, cd04r, zh03r}@ecs.soton.ac.uk

Abstract

Data set V of the BCI competition is comprised of three tasks; that of imagination repetitive self-paced left and right hand movement and the generation of words beginning with the same random letter. In this submission we apply a Directed Acyclic Graph (DAG) SVM [Platt *et al.*2000] to this this problem. The DAG is built from three node where we only ever test two of the given nodes (i.e. the root and one of the children). We use the given three session with labels as a training, validation and testing set respectively. Using this we find that we obtain best results when using a Polynomial kernel of degree two. We the penalty parameter C by using the training and validation data sets. This is done by search for the configuration which produced the best result per node, rather than an over all C value for the entire DAG. During testing we use the previous two decision values with a slack, variable chosen heuristically, to allow for smoothing of the predicted results.

References

- [Platt *et al.*2000] J. Platt, N. Cristianini, and J. Shawe-Taylor. Large margin dags for multiclass classification. In *Advances in Neural Information Processing Systems 12*, pages 547–553. MIT Press, 2000.