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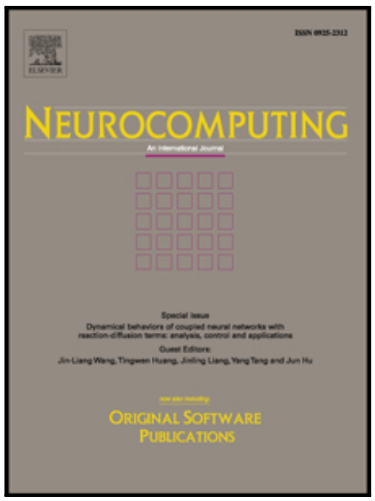

Kernel based online learning for imbalance multiclass classification

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Kernel based online learning for imbalance multiclass classification

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Abstract In this paper, we propose a weighted online sequential extreme learning machine with kernels (WOS-ELMK) for class imbalance learning (CIL). The existing online sequential extreme learning machine (OS-ELM) methods for CIL use random feature mapping. WOS-ELMK is the first OS-ELM method which uses kernel mapping for online class imbalance learning. The kernel mapping avoids the non-optimal hidden node problem associated with weighted OS-ELM (WOS-ELM) and other existing OS-ELM methods for CIL. WOS-ELMK tackles both the binary class and multiclass imbalance problems in one-by-one as well as chunk-by-chunk learning modes. For imbalanced big data streams, a fixed size window scheme is also implemented for WOS-ELMK. We empirically show that WOS-ELMK obtains superior performance in general than some recently proposed CIL approaches on 17 binary class and 8 multiclass imbalanced datasets.

Keywords *Class imbalance, Extreme learning machine (ELM), Kernel learning, Multiclass, Online learning.*

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