Argon injection number	PDF change measure for class 1	PDF change measure for class 2	Updating
2nd	1	0.28	Class 1
3rd	1	0.8	Classes 1 and 2
4th	0.93	0.96	Classes 1 and 2

Table 1: PDF change measure in response to the successive argon injections of Fig 2.

Argon injection number	Misclassification error	
	Incremental classifier	Dynamic classifier
2nd	19	19
3rd	33	8
4th	58	4

Table 2: Misclassification rate calculated for incremental classifier (without forgetting and updating) and dynamic classifier according to the successive argon injections of Fig 2.

4. Conclusion

In this paper, an approach to learn a classifier and to update its parameters and structure according to the changes in its environment conditions is proposed. This approach detects the changes in the classifier environment by observing the changes in its conditional probability density function during a sliding time window. When a significant change is detected, this approach updates the classifier using an incremental learning rule.

We are looking to develop an ensemble classifier approach for the learning in dynamic environments. This approach uses different classification methods to build an ensemble of classifiers. Each classifier is an expert for the classification of patterns in a particular region of the feature space. In addition, each classifier will be adapted for the monitoring of a particular type of changes (gradual, abrupt and recurring).

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