World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:11, No:05, 2017

Online Prediction of Nonlinear Signal Processing Problems Based Kernel Adaptive Filtering

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Abstract : This paper presents two of the most knowing kernel adaptive filtering (KAF) approaches, the kernel least mean squares and the kernel recursive least squares, in order to predict a new output of nonlinear signal processing. Both of these methods implement a nonlinear transfer function using kernel methods in a particular space named reproducing kernel Hilbert space (RKHS) where the model is a linear combination of kernel functions applied to transform the observed data from the input space to a high dimensional feature space of vectors, this idea known as the kernel trick. Then KAF is the developing filters in RKHS. We use two nonlinear signal processing problems, Mackey Glass chaotic time series prediction and nonlinear channel equalization to figure the performance of the approaches presented and finally to result which of them is the adapted one.

Keywords : online prediction, KAF, signal processing, RKHS, Kernel methods, KRLS, KLMS
Conference Title : ICIACC 2017 : International Conference on Industrial Automation and Control Components
Conference Location : Berlin, Germany
Conference Dates : May 21-22, 2017