Article Abstract

Title:	Sensor fault diagnosis for automotive engines with real data evaluation
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Journal:	*International Journal of Engineering, Science and Technology*, Vol. 3, No. 8, 2011, pp. 13-25.
Abstract:	In this paper, a new fault diagnosis method using an adaptive neural network for automotive engines is developed. A redial basis function (RBF) network is used as a fault classifier with its widths and weights on-line adapted to cope with model uncertainty and time varying dynamics caused by mechanical wear of engine parts, environment change, etc. Five different sensors are investigated for an automotive engine including throttle angle, manifold pressure, manifold temperature, crankshaft speed and engine torque. The engine data is acquired from a one-litre Volkswagen petrol engine test bed under different operating states, and then simulated multiplicative faults are superimposed. The real data experiments confirm that sensor faults as small as 2% can be detected and isolated clearly. The developed scheme is capable of diagnosing faults in on-line mode and can be directly implemented in an on-board engine diagnosis system.
Keywords:	Sensor faults, Fault diagnosis, Adaptive neural networks, Fault classification, IC Engines, Radial Basis Function, On-board FDI.