

## PDA 기반의 Wireless 기계상태 감시 시스템

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## Wireless PDA-based Machine Condition Monitoring

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**Abstract :** Mobile computing devices are becoming increasingly prevalent in a huge range of physical area, offering considerable market opportunities. Mobile devices like personal digital assistant (PDA) can support remote condition monitoring in plant equipments. LabVIEW software allows easy interactions between acquisition instrumentation and operators. Also it can integrate artificial intelligence algorithms. This paper presents preliminary results of a platform for remote monitoring system, which aims at enabling mobile access to real-time monitoring data by means of PDA. This system consists of two parts; one is condition monitoring and the other is fault diagnosis by using an ART-KNN neural network. Neural network algorithm does not destroy the initial training. It uses additional training data that is suitable for the classification of machine conditions. Condition monitoring and fault diagnosis are conducted by LabVIEW in a notebook PC. The proposed system is applied to the condition monitoring and fault diagnosis of an induction motor. The application demonstrates that wireless PDA is a convenient device for the development of a powerful user interface in maintenance.

## The Optimal Design of Low Noise of the Engine Cooling Fan using Kriging Method

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## 크리깅을 이용한 저소음 엔진 냉각 팬의 최적 설계

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**Abstract :** This paper proposes an optimal design scheme to reduce the noise of the engine cooling fan by adapting Kriging with two meta-heuristic techniques. An engineering model has been developed for the prediction of the noise spectrum of the engine cooling fan. The noise of the fan is expressed as the discrete frequency noise peaks at the BPF and its harmonics and line spectrum at the broad band by noise generation mechanisms. The object of this paper is to find the Optimal Design for Noise Reduction of the Engine Cooling Fan. We firstly show a comparison of the measured and calculated noise spectra of the fan for the validation of the noise prediction program. Orthogonal array is applied as design of experiments because it is suitable for Kriging. With these simulated data, we can estimate a correlation parameter of Kriging by solving the nonlinear problem with genetic algorithm and find an optimal level for the noise reduction of the cooling fan by optimizing Kriging estimates with simulated annealing. We notice that this optimal design scheme gives noticeable results. Therefore, an optimal design for the cooling fan is proposed by reducing the noise of its system.