

건물 재실자의 건강 위해도 감소 및 에너지 절감을
위한 data analytics 기반의 실내공기질
통합관리시스템 개발

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A principal goal of this research is to develop an integrated management framework for monitoring, modeling, control and optimization of indoor air quality (IAQ) in subway stations considering statistical properties of the IAQ data (non-normal distribution, auto-correlation, periodic variation). First, a self-validated monitoring method that detects and reconstructs sensor faults prior to the monitoring of IAQ is proposed using dynamic independent component analysis (DICA). Then, a self-validated modeling method that combines the sensor fault validation with the modeling method is developed to estimate the IAQ using independent component regression (ICR). In order to keep the IAQ at a healthy range, an IAQ ventilation control system considering outdoor air quality is newly developed. Finally, to maintain the IAQ at a healthy range while saving ventilation energy consumption, optimal operational conditions of the ventilation control system are determined using iterative dynamic programming (IDP).

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