# Liquid time-constant networks 기반 지하철 실내공기질 모델링 및 민감군 인체위해성 warning 평가

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This study developed a data-based soft-sensor to predict indoor $PM_{2.5}$ from easy-to-measure indoor air quality variables. The method consists of liquid time-constant networks, a subclass of continuous recurrent neural networks represented by an ordinary differential equation system. Two types of wiring were considered: 1) a fully connected (LTC-FC) and 2) neural circuit policies (LTC-NCP). This last includes four sensory layers loosely inspired in the neural system of the nematode *C. elegans*. The performance metrics indicate that the LTC-NCP yielded the most accurate predictive performance accounting for an improvement compared to other linear and neural methods of 44% using RMSE, 29 – 38% using MAPE, and 50 – 80% using $R^2$. The LTC-NCP outperformed the LTC-FC model, comparing the critical success index and false alarm rate values of 0.7132 and 0.1849.

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