

Artificial neural network models for ambient air pollution prediction

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There has been a growing attention in recent years on the use of artificial neural networks (ANNs) in predicting and forecasting ambient air pollution, since poor air quality in urban areas has been linked to chronic diseases and premature mortalities. Pressure is directed towards policymakers and urban city planners to provide solutions to minimize air pollution levels and avoid the adverse effects of air pollution.

In recent years, ANNs have been successfully implemented in many short- and long-term forecasting applications. Furthermore, more practitioners resort to data-driven approaches such as ANNs as alternatives to traditional deterministic or physics-based approaches. ANN models allow the forecasting of outdoor PM₁₀, PM_{2.5}, nitrogen oxides, and ozone levels. Moreover, hybrid ANN model types are often used in air quality studies.

Some works explore this subject (Miranda et al., 2016; Relvas et al., 2017; Relvas and Miranda, 2018) and are included as pdf files.

Miranda, A.I., Relvas, H., Viaene, P., Janssen, S., Brasseur, O., Carnevale, C., Declerck, P., Maffei, G., Turrini, E., Volta, M., 2016. Applying integrated assessment methodologies to air quality plans: Two European cases. *Environ. Sci. Policy* 65, 29–38. <https://doi.org/10.1016/j.envsci.2016.04.010> (PDF)

Relvas, H., Miranda, A.I., 2018. An urban air quality modeling system to support decision-making: design and implementation. *Air Qual. Atmos. Heal.* 11, 815–824. <https://doi.org/10.1007/s11869-018-0587-z> (PDF)

Relvas, H., Miranda, A.I., Carnevale, C., Maffei, G., Turrini, E., Volta, M., 2017. Optimal air quality policies and health: a multi-objective nonlinear approach. *Environ. Sci. Pollut. Res.* 24. <https://doi.org/10.1007/s11356-017-8895-7> (PDF)