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Analysis of ventilation in a classroom with machine learning

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Abstract

Air residence time is an important parameter which is a measure of the time which air spends in a region before being replaced by fresh air. Monitoring and ensuring optimum values of air residence times in a room is essential to prevent the spread of airborne infectious diseases. The objective of this case study is to perform flow and air residence time simulations and analyse air flow patterns that exist in a classroom environment (Chemical Engineering classroom, IIT Bombay). A machine learning model has been deployed to predict air residence times without running the flow simulations, to save computational time and power. Finally, some improvements in ventilation have been suggested by introducing interventions in the flow domain.

References

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