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Title	働き場での空気の換気を効果的にコントロールするための バイオミメティクリー法によるファサードデザイン
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Abstract

The increasing prevalence of airborne pollutants in workplaces has heightened the importance of developing innovative air quality solutions. This study introduces the "mimosa kinetic facade," an innovative system inspired by the unique leaf movements of the Mimosa plant. This facade comprises of a number of autonomous shading devices that adjust airflow, diffusing and filtering airborne contaminants effectively. Through a combination of computational simulations and in-person evaluations, the study investigates the facade's potential for improving indoor air quality in workplaces. The research technique included the design, optimization, and actual testing of the kinetic facade, which demonstrated its great effectiveness in minimizing airborne contaminants. Notably, the facade's unique flexibility enables it to continuously re-calibrate in response to environmental changes, achieving the ideal balance between natural ventilation and pollutant dispersion. Among the numerous kinetic facade patterns evaluated, kinetic facades, particularly certain patterns, demonstrated enhanced ventilation compared to static ones. Some patterns prioritized ventilation, while others optimized human comfort during extended stays. The study proposes combining these patterns strategically to optimize their aggregate benefits. In essence, the mimosa kinetic facade emerges as a sustainable and proficient alternative to traditional ventilation systems, promoting a healthier and more favorable indoor environment.

Keywords: Kinetic façade, Mimosa Pudica, Cross-ventilation, Biomimicry method, Computational Fluid Dynamics (CFD)