

## **A Biomimetic Approach for the Multi-Objective Optimization of Kinetic Façade Design**

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**Abstract :** A kinetic façade responds to user requirements and environmental conditions. In designing a kinetic façade, kinetic patterns play a key role in determining its performance. This paper proposes a biomimetic method for the multi-objective optimization for kinetic façade design. The autonomous decentralized control system is combined with flocking algorithm. The flocking agents are autonomously reacting to sensor values and bring about kinetic patterns changing over time. A series of experiments were conducted to verify the potential and limitations of the flocking based decentralized control. As a result, it could show the highest performance balancing multiple objectives such as solar radiation and openness among the comparison group.

**Keywords :** biomimicry, flocking algorithm, autonomous decentralized control, multi-objective optimization

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