

明治大学先端数理科学インスティテュート

MIMS現象数理カフェセミナー

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A Mathematical Model for Understanding and Creating Impossible Object Illusion

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Abstract: Impossible objects were first proposed as imaginary 3D structures that exist only in our brains when we see anomalous pictures. It had long been believed that they cannot be realized as actual 3D solids unless we use tricky structures such as discontinuities that appear continuous or curved surfaces that appear planar. However, we found that some of impossible objects can be constructed without those tricks. Starting with this discovery, we have extended the sense of impossibility to various forms. They include “impossible motions”, “ambiguous cylinders”, “partly invisible objects” and “topology-disturbing objects”. We present a mathematical model for understanding pictures of 3D objects, which was first considered for computer vision but also useful for understanding human vision, and show how it can be used for creating new types of impossible objects.



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