

Geometry, Mechanics, and Control for the study of – The falling cat –

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Abstract

A falling cat does not rotate in the air, but can make a turn to fall on its legs when launched in the air. The behavior it can do in the air is vibration only. This means that vibration can result in a rotation in effect. Rotation and vibration are rather mathematical notions, which are defined in the context of the connection theory. The body of the cat in motion should be subject to the equations of motion in mechanics, and the cat can move (vibrate or twist) its body with a designed internal force of control. In order to explain or model the falling cat, differential geometry, classical mechanics, and control theory should be well weaved together. This talk gives a fine modeling for the falling cat.