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Learning locomotion movements in a physical cartoon simulation

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Physics-based character animation has seen significant advances in recent years. Optimization and reinforcement learning methods have made it possible to increase the complexity of learned movements [1, 3, 8, 9, 10]. These approaches generally aim to produce realistic movements, similar to those of humans, while respecting real physical laws based on motion capture data. However, in the field of cartoons or cinema (action, science fiction, or fantasy films), physics is often distorted [2]: the laws of motion are deliberately exaggerated or modified to enhance the humor, expressiveness, or spectacular nature of the scenes (see Figure 1).

We propose to explore a motion generation model in a “zany” physical simulation [2], where the laws of physics are adjusted to produce expressive and unexpected behaviors. We want to integrate physical parameters into the learning process, such as adding virtual forces to assist or disrupt the character. Experiments will begin on a simplified model before moving on to more complete morphologies, guided by data from movie scenes or cartoons.

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Informatique

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