

Research Internship

“Virtual Steadicam Simulator”

Team

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Keywords

Animation 3D, Virtual Cinematography

Context

The convergence between video games and real cinematography[1] has led to the wide adoption of classical cinematographic techniques to convey narratives in virtual and interactive 3D environments. However the creation of a compelling cinematography remains mostly a manual endeavor performed by talented artists [2], who look at replicating the feel of traditional cinematographic devices such as cranes, dollies and travellings, but also of modern devices and techniques like the steadicam, spidercam or handheld cameras.

The Steadicam is a wide-spread cinematographic device that is now central in movie making. It enables the creation of dynamic and stabilized camera motions with the freedom of motion of a single person. To ensure stability, a complex spring-articulated and balanced structure attaches a camera to a cameraman, and the camera is controlled through gentle actions performed around the center of gravity of the camera structure.

Yet, the creation of realistic steadicam-like motions in virtual 3D environments remains a challenge. The problem is related to the physical simulation of the spring-articulated structure, but also to the means for the animator to control the motion with a computer, which encompasses means to move like a cinematographer, and means to perform actions like swiveling, arcing, raising and lowering the device.

Objectives

The main objective of this internship is therefore to design an interactive manipulation technique for an animator to control a virtual steadicam and be able to reproduce steadicam-like motions.

The work will first consist in studying and modeling the physics of the steadicam device and having discussions with steadicam operators (visits will be organized in Paris studios Planning Camera[3]), in order to design a virtual steadicam simulator. Then a broad exploration phase will consist in studying means to interact with the virtual steadicam. Approaches such as physical interfaces (like simulcams[4]) or VR-based modalities using immersion and motion capture (eg HTC Vive and leapmotion[4]) are possibilities. Third, a research prototype will be designed and implemented to evaluate the benefits wrt to traditional animation techniques.

Bibliography

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- [4] C Lino, M Christie, R Ranon, W Bares, The director's lens: an intelligent assistant for virtual cinematography, Proceedings of the 19th ACM international conference on Multimedia, 323-332

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