

Virtual Cinematography: Beyond Big Studio Production

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Figure 1. Mobile Virtual Camera System featuring the Apple iPad and Playstation Move & Navigation Controllers.

1. Introduction

In the current production environment, the ability to previsualize shots utilizing a virtual camera system requires expensive hardware and large motion capture spaces only available to large studio environments. With accessible hardware such as multi-touch tablets and the latest video game motion controllers, there exists an opportunity to develop a new virtual camera system utilizing only consumer technologies and openly accessible game engines. The MobileVCS system is designed for directors, both amateur and professional, who wish to embrace the notion of Virtual Production for films and game cinematics without a big studio budget. The director will be able to compose and record camera motions in freespace and manipulate scene elements, such as characters & environments, through a real-time intuitive touch interface that is guided by system intelligence based on cinematic principles. By exploring these new immersive hybrid interface possibilities and democratizing this technology, all directors will now be able to achieve their creative vision by previsualizing their scenes and shot compositions without the need for expensive hardware or large motion capture volumes. MobileVCS has potential applications to other areas including game level design, real-time compositing & post-production, and architectural visualization

2. Exposition

Utilizing affordable hardware, an intuitive user interface, the real-time benefits of game engines, and an intelligent camera system, MobileVCS provides professional directors as well as a new market of amateur filmmakers the ability to previsualize their films or game cinematics with familiar and accessible technology. The support of both free-space movement and controller-based navigation with adjustable scene scales permits the user to navigate the virtual space and record camera motion in a variety of means. The user can additionally mark keyframes for virtual dollies or booms, and control camera parameters such as focal length or aspect ratio. An important aspect of our system is the inclusion of cinematic principals for intelligent generation of shots. For example, dolly tracks and timings are generated based

on physically-guided principals in order to produce realistic camera paths. MobileVCS also supports rudimentary scene editing, and has the ability to integrate into a professional production pipeline such as exporting camera paths or scene descriptions with industry software packages such as Autodesk Maya. Additionally, integrating both the external Move camera and the internal iPad camera streams permits multi-perspective highly-flexible mixed-reality shot composition.

3. Implications of Research

MobileVCS supports an iterative production pipeline that can lower production costs by allowing directors and cinematographers to experiment with their shot compositions throughout the production process instead of simply at the previsualization stage, and has application for set layout, level design, and lighting design. Its ability to continually build more intelligence into the tool has the potential to open up a new market of amateur content makers ranging from students to small-production teams that cannot afford the cost of studio previsualization tools and who might not even fully understand the theory and principles of shot layout. The intelligence can be customized to both create more professional content or even serve as an educational tool to guide the user; this flexibility permits MobileVCS to expand in the future as a hybrid freespace input device for video games, robotics, and medicine.

References

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