Virtual stage management for immersive storytelling
PhD Thesis Proposal

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Context
This PhD thesis is proposed as part of an ongoing collaboration between the ANIMA team at Inria and the SPATIAL MEDIA team at EnsadLab (Ecole des Arts Décoratifs, Paris) on « directing immersive virtual reality ».

Objectives
Immersive virtual reality is a powerful media for interactive storytelling, but computational tools are lacking both for authoring and controlling the experience. Drawing inspiration from theatrical storytelling [1] we would like to propose new methods for authoring and directing a virtual performance driven by a given play script, to be experience in a virtual reality headset. While previous work exists for structuring and executing a movie script in animation [2,3], immersive virtual reality raises additional challenges because both the player and the non player characters are free to move on the virtual stage. We therefore need new tools for managing the virtual stage, including monitoring the player movements, animating the non player characters, and synchronizing them while the story unfolds.

To reach those goals, the candidate will review « blocking notations » used in traditional stage management [4,5] and extract a subset of useful actions that can be efficiently implemented in 3D animation; design and implement algorithms for synchronizing player and non player actions under the timed petri net model suggested by [2] ; and design and implement algorithms for recognizing player actions in a VR environment.

The proposed architecture will be tested and validated in immersive virtual reality storytelling experiments conducted by artists, researchers and students at EnsadLab during the thesis.

Requirement
For this PhD thesis, we are looking for candidates with a strong background in real-time graphics programming and mathematics, excellent writing and speaking skills in French and English, and an interest in storytelling and virtual reality.

References