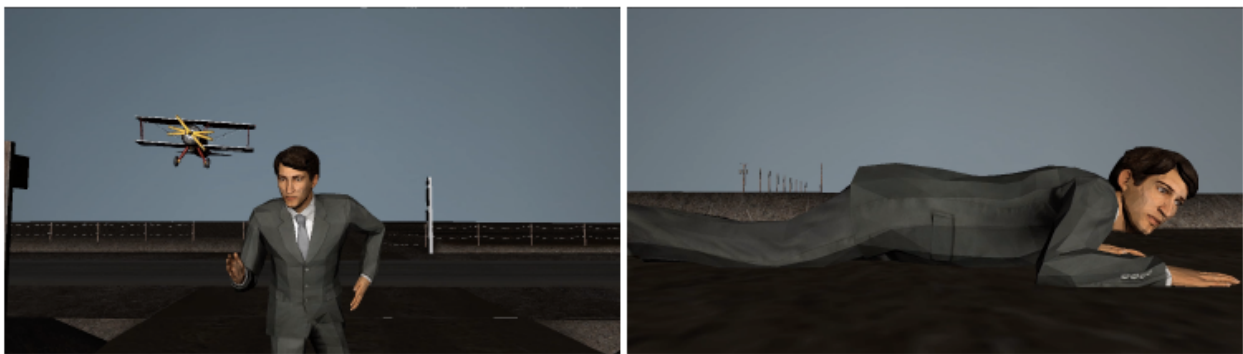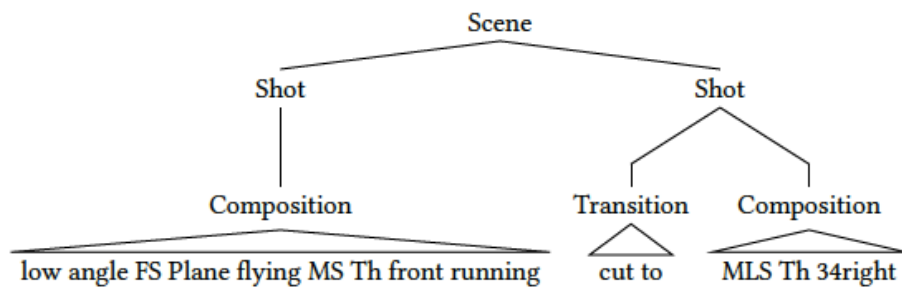# Sketching cinematography: from storyboard to layout animation

Masters Thesis Internship
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Context

ANIMA is a computer graphics team created in July 2020 at Inria and Univ. Grenoble Alpes to invent new methods for authoring and creating story worlds. Towards this common goal, we pursue research in geometric modeling, physical modeling, semantic modeling and aesthetic modeling.

Objectives

A long term objective of the ANIMA team is to create animation from movie scripts [6]. To this effect, we have designed the prose storyboard language, a formal language for describing movies shot by shot, where each shot is described with a unique sentence [5]. The language uses a simple syntax and limited vocabulary borrowed from working practices in traditional movie-making, and is intended to be readable both by machines and humans. The language is designed to serve as a high-level user interface for intelligent cinematography and editing systems.

Goals

In this internship, our goal will be to build a software cinematography agent that can take prose storyboards as an input, and produce fully realized shots as an output, given a 3D scene with suitable character animation.

The following topics will need to be investigated
- geometric positioning of the camera and actors in the 3D scene to achieve a given screen composition
- generation of actor and camera movements smoothly interpolating screen compositions

Previous work on the generation of movie shots from storyboard-like representations [1,3,4] has been limited to scenes with two characters and limited camera movements. Our goal in this internship will be to propose solutions for shots with three or more characters and complex camera movements (dolly and crane shots). To do this, we will need to find a suitable parameterization of all scene elements in camera coordinates, and prioritize the many constraints contained in the prose storyboard, so that a best-effort solution can be returned in all cases.

For this internship, we will provide a prose storyboard parser, which produces a Timed Petri Net representation of the shot, suitable for the simulation of synchronized camera and actor movements. Based o this abstract representation, a prototype system will be designed and implemented for generating 3D animation in the Unity 3D game engine. For testing and validation, we will provide a large dataset of prose storyboards extracted from famous movies where we have manually reconstructed the corresponding 3D scenes [2].

The internships is offered to Master students with a good knowledge of computer vision and computer graphics, excellent programming skills, curiosity and enthusiasm, and is expected to lead to a PhD on a related topic

References

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