Delivering cinematography in a virtual environment is a challenging task due to the high degree of freedom of virtual cameras. In this work, we propose a method to generate a cinematography based on a given reference video.

Given an unprocessed video, we segment the video into a sequence of shots. Framing and camera movement types are classified from each shot. Using the analyzed information and the staged 3D assets, the virtual cinematography is generated in 3D w.r.t. the reference video.

### Methods

**Shot Boundary Detection**

SVM Classifier
- **input**: colour and motion vector of consecutive frames
- **output**: transition points of the video

**Cinematography Classification**

Framing Classifier using OpenPose [CHS18]
- **input**: reference video
- **output**: framing type

Camera Movement Classifier using MLP
- **input**: motion vector of the video
- **output**: camera movement type

**Virtual Camera Generation**

Framing Generation [LC15]
- position the camera using the classified framing and the skeletal parts of the 3D subject

Camera Movement Generation
- interpolate the camera using the classified camera movement

### Results

10 shots from *Back to the Future* (1985)

panning left camera movement from *Back to the Future* (1985)

### References
