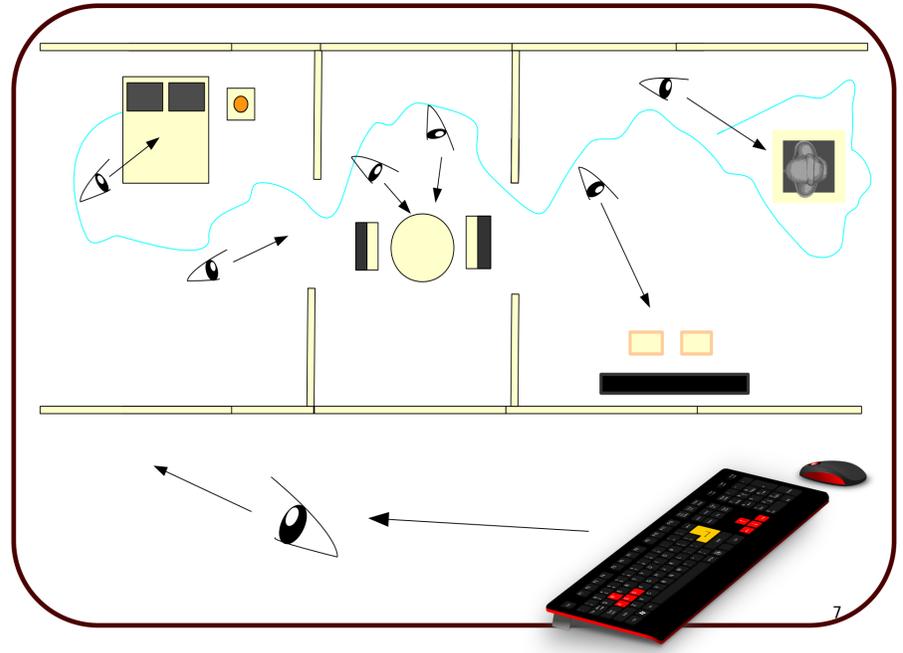




The rapid growth in the use of 3D graphics has brought to the creation of a very large number of 3D models. This has pushed research towards fast 3D mesh search and retrieval and in building concise presentations visualizing salient views of the 3D mesh to the user. This thesis contributes to this research field with a novel framework to build a cinematographic video presentation of a 3D static scene.

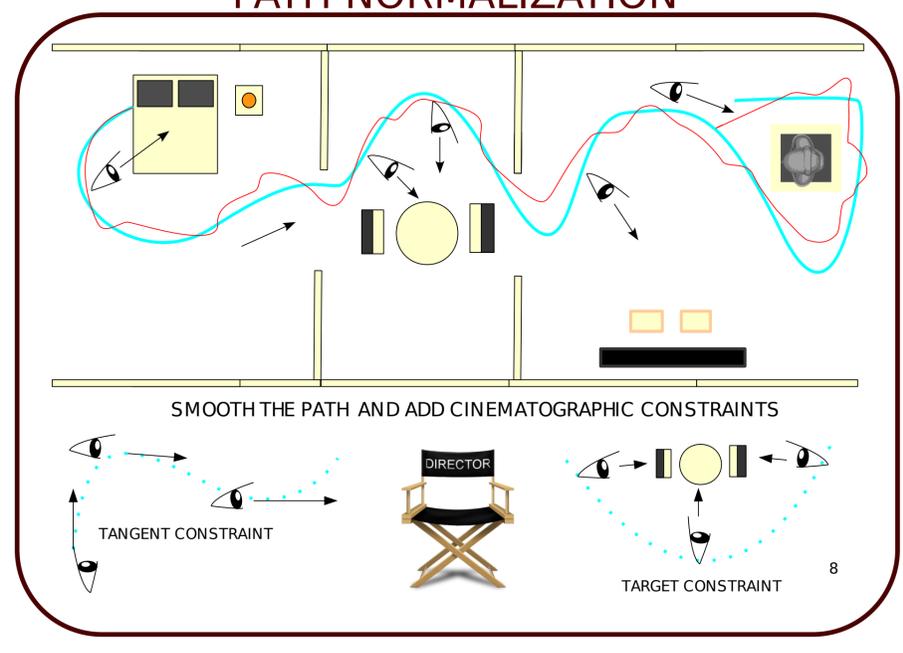
PATH SKETCHING



Path sketching: after importing a 3d scene, the systems starts recording camera intrinsics and extrinsics parameters while the user sketches camera movements.

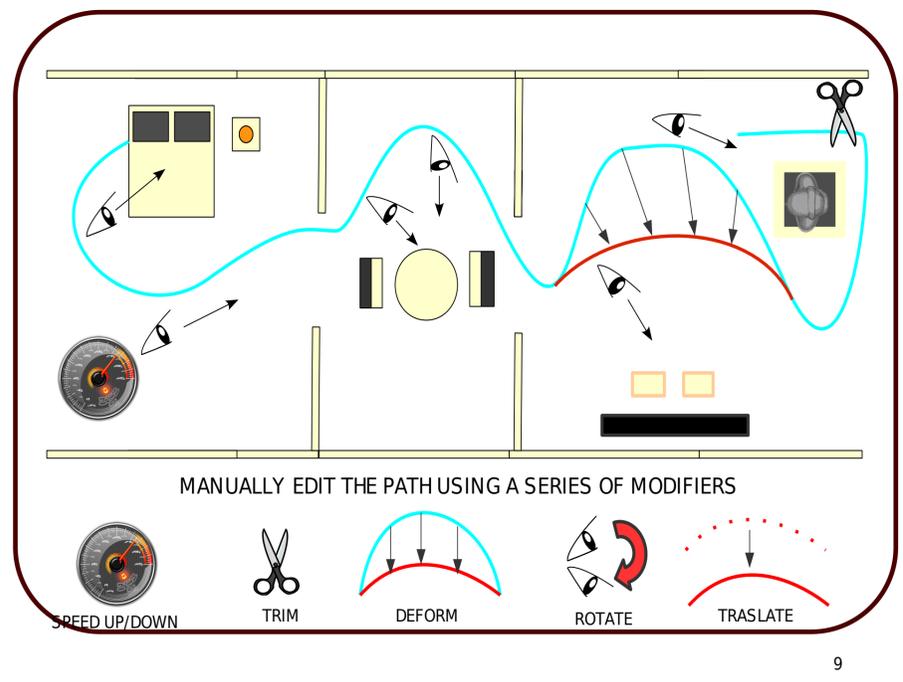
Path normalization: the resulting shots are converted to a more compact and easily editable representation based on a parametrization of the camera path using a piecewise Bézier curve. Shots are then edited to comply to cinematographic constraints. The tangent constraint simulates a *steady-cam shot* while the target constraint can mimic a *tracking shot* or a *crane shot*.

PATH NORMALIZATION



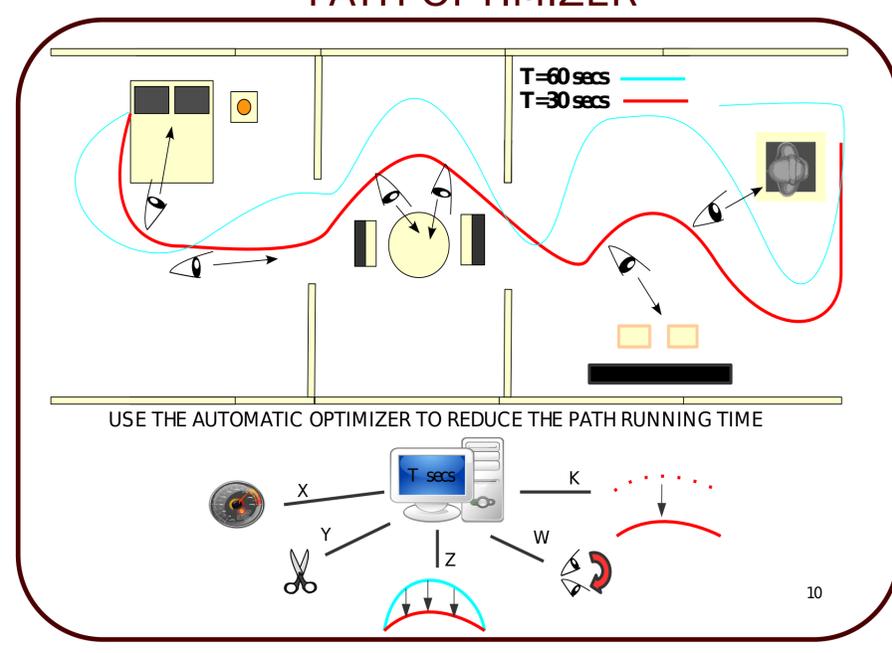
Path editing: Given this new representation, the user can manually edit the path. The user can change the speed or the orientation of the camera along the path. Moreover, the path can be deformed,

PATH EDITING



Path optimizer: The system can also automatically edit the camera path to optimize it, that is, to reduce the video running time. We mathematically define the editing of camera movement as a constrained optimization problem where the unknowns are the modifications of the input shots, the constraints are the total running time and the stylistic choices and where the objective function is the difference of the *optical flow* from the original input movements.

PATH OPTIMIZER



FUTURE WORKS

Automatic path generator: we will investigate a novel path generation algorithm which takes into account cinematographic styles and rules.

Automatic montage: a relevant extension would be to implement an automatic montage system which can assemble the video sequences to obtain the final movie. This tool should have the power of deciding the order in which the sequences will be displayed and where to cut the current sequence to pass to the next one.