Volumetric Representation for Interactive Video Editing

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Issue: Effective visualisation of the temporal axis in video editing operations is not readily achievable in a conventional digital video editing environment.

Approach: The use of volumetric video visualisation managed within an achievable interactive editing context.

Video editing can be a complex and time-consuming task commonly involving the review of substantial quantities poorly labelled, repetitive and lengthy material. Effective visualisation of the temporal axis (sequence of events) is seen as crucial to interface improvements within this arena.

Volumetric Video Visualisation
Using an established interactive volume rendering approach [1] and building upon the prior work of [2] we develop an interactive interface for video editing using an optional 3D volumetric visualization for video display.

Interactive Performance
A key difference between interactive application of this approach in prior medical volumetric work [1] and video [2] is the volume of data. A medical volume scan may have at most 1000s of slices whilst a video clip has 25 images (i.e. slices) per second of video (e.g. 25 fps video) - 25 min. colour PAL video ≈ 2 Gb data.

By exploiting perceptive visual redundancy we present a dynamic temporally and spatially sub-sampled representation linked directly to the manipulation of the raw video content for editing operations.

Future work: Investigation of user perception issues relating to spatial/temporal sub-sampling and the alternative use of more recent advances in large-scale volume rendering.