Haptic Rendering of Dynamic Image Sequence Using String based Haptic Device SPIDAR

Authors : Jayasiri, Anusha, Akahane, Katsuhito, Sato, Makoto (2012)

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This paper concerns how to associate haptic signals with a dynamic image sequence or in other words a video to feel the haptic motion. Nowadays, there is a significant evolvement in haptic technologies and they are being used in a wide range of application areas. With the invention of digital multimedia and immersive displays, significance of exploring new ways of interacting with video media has grown up. However, the incorporation of haptic interface technology into a dynamic image sequence is still in its infancy. Rather than just seeing and hearing a video, viewers' experience can be further enhanced by letting them feel the movement of the objects in the video through haptic interface, as it is an additional sensation to seeing and hearing. The objective of this research is to use haptic interface technology to interact with a dynamic image sequence and enable the viewers to feel the motion force of objects in the video beyond passive watching and listening. In this paper, we have discussed how to feel the haptic motion, which is computed from frame to frame calculation of velocity using optical flow. For haptic motion rendering, we have evaluated two methods using a gain controller and using a non-linear function to identify a better method. To interact with the video we used the string based haptic device, SPIDAR, which provides a high definition force feedback sensation to users.