香港城市大學
City University of Hong Kong

Investigation of Quality of Experience in Online Learning

Project Number: 6000713

Principal Investigator: Dr. Shiqi WANG

Grant Type: TDG

Abstract:

Recently, online or blended learning serves as an alternative but effective manner to ensure high quality teaching. The online learning relies on videos (including both the shared screen and the captured scenery) as the main media. Compared to audio, video is featured with high data volume, and unfortunately inevitable distortions will be introduced in the video production chain from acquisition till the delivery to the end users. As a concrete example, videos must be compressed before being transmitted to end users, as an one hour 1080p video (30fps) could consume 600GB without compression. Such amount of data could not be affordable when they are delivered to students in different places, such that undoubtedly the video distortion (blur, low frame rate, stalling, delay) is the most prominent source that hinders high quality online learning. The video compression and processing pipelines significantly influence the quality of experience in online learning, and nurturing the interactive and engaging learning environment demands the investigation of video quality in a scientifically sound way. As such, it is highly desirable to investigate the quality of experience from the ultimate receiver (student) point of view. As a matter of fact, the content of online learning videos is largely different from traditional natural videos, and the quality of experience of online learning has been largely ignored in the academic research. As such, this project aims to study the quality of experience of the online learning from different perspectives and under different usable scenarios, to improve the teaching and learning experience under the constraint of resources. Successful implementation of this project could provide useful guidance on the online teaching and ensure that high quality visual content will be delivered from the perspective of video quality. Based on the proposed scheme, the video delivery to end users could also be optimized such that the quality of learning experience for individuals could be improved from a technical perspective.

Academic Publication:

Chen, B., Zhu, L., Li, G., Lu, F., Fan, H., & Wang, S. (2022). Learning generalized spatial-temporal deep feature representation for no-reference video quality assessment. IEEE Transactions on Circuits and Systems for Video Technology, 32(4), 1903–1916. https://doi.org/10.1109/TCSVT.2021.3088505

Chen, B., Li, H., Fan, H., & Wang, S. (2021). No-reference screen content image quality assessment with unsupervised domain adaptation. IEEE Transactions on Image Processing, 30, 5463–5476. https://doi.org/10.1109/TIP.2021.3084750