INDIANA UNIVERSITY INFORMED CONSENT STATEMENT FOR

A Study of 360-degree Video Viewing Behavior on Laptops/PCs

Sponsored by Indiana University

You are invited to participate in a research study of 360-degree video viewing behavior on laptops/PCs. You were selected as a possible subject because you are at least 18 years old and are affiliated with IU Bloomington. Please read this form and ask any questions you may have before agreeing to be in the study.

The study is being conducted by Professor Feng Qian in the Computer Science Department, School of Informatics, Computing, and Engineering at Indiana University Bloomington. It is funded by Indiana University.

STUDY PURPOSE

As an important component of the virtual reality (VR) technology, 360-degree videos provide users with panoramic view and allow them to freely control their viewing direction during video playback. Usually, a player displays only the visible portion of a 360 video. Thus, fetching the entire panoramic video frame wastes network bandwidth. In this research, we consider the problem of optimizing 360 video delivery over bandwidth-constrained networks such as wireless networks. We propose a bandwidth-friendly streaming scheme that delivers only 360 videos' visible portion based on viewport prediction.

The central hypothesis for our proposed approach is, when watching a 360 video, users' viewing direction can be predicted (at least in the short term) so that the video player can fetch the predicted visible portion instead of the entire panoramic frame to save the bandwidth. We plan to leverage a user study to demonstrate such feasibility.

360 videos can be watched in different ways. In this study, we explore how predictable a user's viewport is when 360 videos are being watched on a laptop or PC. Through this interaction method, a viewer controls the viewport by dragging/panning the mouse. An example can be found here when you watching it on your computer: https://www.youtube.com/watch?v=-xNN-bJQ4vI&t=2s

In this study, we recruit voluntary subjects to watch diverse 360-degree videos on their laptops/PCs through a browser-based player we developed. During video playback, you can freely change their viewports by dragging (panning) the mouse. In the meanwhile, our player will capture the viewport position in terms of latitude and longitude as well as your mouse input. After playback, you will need to email us the captured trace. The collected viewport data will help us design and optimize viewport prediction for 360 videos consumed on laptops and PCs.

NUMBER OF PEOPLE TAKING PART IN THE STUDY

If you agree to participate, you will be one of about 200 subjects who will be participating in this research.

PROCEDURES FOR THE STUDY

If you agree to be in the study, you will do the following things.

1. To begin with, we will provide you (over email) with instructions to set up the data collection software. The setup is easy and takes less than 5 minutes to complete. It consists of two steps. First, download the entire

software package containing the player and ten 360-degree videos. Second, run a 3rd-party local web server program (provided with the software package) from which our browser-based player can be launched.

The ten videos you are going to watch were obtained from YouTube. They contain diverse contents. We cut some of the long videos to make the total running time about 40 minutes. None of them contains adult-only, violent, or illegal contents.

2. You can now launch our video player to watch the videos. During playback, you can freely change the viewport by dragging (panning) the mouse. **You MUST use the Google Chrome browser. You MUST use a mouse. You MUST focus on actively interacting with the player. You MUST NOT move the player to the background or switch to another browser tab.** Meanwhile, our player continuously collects the viewport direction data in terms of latitude and longitude, as well as your mouse input. At the end of the playback, the player will save the collected data to a file and return it to you. Keep that file as it is. You need to watch all 10 videos and keep the 10 data files (one per video).

3. After you have watched all 10 videos, you will need to send all 10 trace files to us by email. Then you can delete our software, videos, and the trace files. Typically the whole study takes less than 1 hour (40 min playback + 5 min setup + 10 min for reading instructions). However between videos, you can take a break that is arbitrarily long.

We will provide step-by-step instructions (illustrated with screenshots) on how to complete all aforementioned steps so that you can perform the study easily. You do not need any technical background in computer science. Instructions for Windows and Mac OS will be provided separately.

We will examine your data. If the data is incomplete (missing some videos), we will ask you to collect the missing data.

RISKS OF TAKING PART IN THE STUDY

Some of you may feel uncomfortable when watching VR contents. This is known as "virtual reality sickness", which occurs when exposure to a virtual environment causes symptoms that are similar to motion sickness symptoms.

However, for this study, you will not wear VR headsets. Instead, you will watch 360 videos directly on computers. This is quite similar to watching a regular video except that you are interacting with the player using a mouse. Therefore, the likelihood of virtual reality sickness is considered to be minimal, if any. Nevertheless, at any time during the experiment, when you are feeling uncomfortable, you should stop the experiment immediately.

BENEFITS OF TAKING PART IN THE STUDY

Participating in this study provides no direct benefit to the subject except the monetary compensation.

CONFIDENTIALITY

Although we cannot guarantee absolute safety and confidentiality, we expect this study involves no more than minimal risk due to three reasons. Efforts will be made to keep your personal information confidential. Your personal information may be disclosed if required by law. Your identity will be held in confidence in reports in which the study may be published.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the Indiana University Institutional Review Board or its designees, the study sponsor Indiana University, and (as allowed by law) state or federal agencies,

specifically the Office for Human Research Protections (OHRP), etc., who may need to access your research records.

PAYMENT

If you complete the study and upload the data for all 10 videos, we will compensate you $20 for your participation. If you provide incomplete results, we provide partial payment of $10. No other compensation will be paid. We will pay you within 3 days after we receive the uploaded data.

CONTACTS FOR QUESTIONS OR PROBLEMS

For questions about the study or a research-related injury, contact the researcher, Feng Qian, at 812-856-5521, or fengqian@indiana.edu. If you cannot reach the researcher during regular business hours (i.e., 8 a.m. to 5 p.m.), please call the IU Human Subjects Office at 812-856-4242 or 800-696-2949.

For questions about your rights as a research participant, to discuss problems, complaints, or concerns about a research study, or to obtain information or offer input, contact the IU Human Subjects Office at 812-856-4242 or 800-696-2949.

VOLUNTARY NATURE OF THIS STUDY

Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty. Your decision whether or not to participate in this study will not affect your current or future relations with the Indiana University or the School of Informatics and Computing at IU.