Submission Details: gensub_258s1

First saved: 2018-02-11 07:02
First completed: 2018-02-13 06:08
Last updated: 2018-02-13 09:33

General Submission Title

General Submission Title: FacePunch: Experiencing Pressure Forces on Face with HMDs

Presentation Format

Presentation Formats: Installation

Speaker/Moderator Information

Speaker/Moderator 1:
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Biography:
Will this person present the submission at the conference? Yes
Is this person interested in reviewing for SIGGRAPH? No

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Is this person interested in reviewing for SIGGRAPH? No

Abstract

Abstract (Maximum 300 words):

We present FacePunch, a system incorporated with head mounted display producing kinesthetic normal force on face. The main concept is shifting torque provided by two DC motors to a normal force. The normal force triggered by HMD simulates a pressure feedback on user's face. The strength is determined by the rotated angle and the duration is determined by the rotating speed of motor. Thus, FacePunch can produce discrete/continuous and weak/strong stimuli and generate kinesthetic haptic force for various scenarios. Furthermore, we considered the contact surface of Vive headset and user's face as a natural haptic region, so that the motor actuator system and HMD are integrated altogether. Two experience scenarios were implemented for FacePunch. First, we demonstrate discrete and instantly normal force acting on face representing being hit in a boxing competition. Second, we created a diving scenario to show the haptic feedback of the pressure of water flow acting on face.

Submission Information

Intended Audience: Beginner
Project URL (to be used for conference publicity and media inquiries):
Contact Email (for media and attendee inquiries):

Reviewer Type

Reviewer Type: A Designer
A University Professor

Keywords

Keywords: Research
VR/AR

Presentation Information

Has this work appeared or been submitted elsewhere? No
Will your presentation at the conference differ from the materials you upload. (ie., Electronic file format doesn't properly capture physical characteristics, Unable to upload final imagery yet due to copyright restrictions, etc.): No
Would you like to request review by the English Review Service? (Non-native English speakers may use the English Review Service to help with text of submissions. Please note that this takes time, so your submission must be sent to the English Review Service well in advance of the published deadline.): No

Submission Option: ACM SIGGRAPH Education Resources

If your submission is not selected for the conference, you may opt to submit my materials to the ACM SIGGRAPH Education committee for CGEMS or cgSource consideration.
If your submission is selected for the conference, you can still opt to make a separate, modified submission to the ACM SIGGRAPH Education Committee for CGEMS or cgSource consideration.

Talk

Please choose the preferred length of your talk.

If you anticipate specific requirements for your presentation venue, or special needs for your talk other than standard presentation equipment, please describe here to assist the Jury in evaluating your Talk:
If the jury finds your talk to be more appropriate for educators, are you willing to have your talk scheduled as part of the Educator's Forum sessions (education-related content open to Select Conference attendees and above)?

Course

Describe your intended audience:
Prerequisites:
What kind of venue do you feel is most appropriate for the course?
Proposed Course Schedule:
Special presentation requirements:
Has this course been offered at a previous SIGGRAPH?

Installation

How will the attendees interact with this installation?

Attendee interacts with FacePunch system through two applications. In the first application, attendee stands at the center of our floor plan then she/he will start to experience our device. In the second application, attendee sits on a chair, wearing wrist straps attached with Vive trackers on both hands, then stroke her/his arms as swimming. Next, attendee starts experiencing our game with haptic feedback provided by FacePunch.

Is there a physical take-away for attendees? No
Is there a digital take-away for attendees? No
Would you consider this technology to be novel? Yes
Please explain:

FacePunch is a pulley system incorporated with a HMD to display pressure forces on user face. Unlike GyroVR and HangerOVER which enabled tangential/rotational force on user head, FacePunch's pulley system creates normal force on the face region covered by the HMD. The main concept of FacePunch is shifting torque provided by the two motors to a normal force pushing on face. This normal force triggered by the motors pushes the HMD into user face resulting in pressure feedbacks on the face.

If your installation is accepted, are you interested in giving a presentation about your installation (subject to the jury's recommendation)? Yes
Please provide a 50-word description about your Experience Presentation.

We will emphasize the novel experience provided by FacePunch, which is a pulley system incorporated with a HMD to display pressure forces on user face. Unlike GyroVR and HangerOVER which enabled tangential/rotational force on user head, FacePunch's pulley system creates normal force on the face region covered by the HMD.

Size/space requirements of installation (be sure to specify the units, i.e., 3x3m. or 10ft. x 10ft.): 3x3m
Date of completion when the proposed device/item is expected to be completed and ready for show (if the work is already completed and is ready to show, enter today's date). 2018-02-13
Lighting Requirements: Needs darkness due to projection
Lighting Emission: Does not give off any light whatsoever
Sound Requirements: Is indifferent to sound (could be in loud or quiet area of exhibition
Sound Emission: Produces some sound, but only within the confines of the piece
Does your installation need a wired internet network connection? Yes
Please describe your wired network requirements. (bandwidth, number of devices): The network bandwidth we need is 100Mbps (download)/100Mbps (upload). Only one device need network.
Does your installation need a wireless internet network connection? No
HELP! - I need to speak with someone about networking needs for my installation. No
Briefly describe your technical needs, setup time, and procedures. (For example, will you need to rig any equipment overhead? What are your desired space requirements? How many Electrical outlets do you

think you might need? Any other technical setup information that would be insightful?):
One day to setup our PC and HTC Vive. We need 12 electrical outlets in total to support the power or PC, HTC Vive, projector, and FacePunch. 3 tables and 6 chairs are needed.
Briefly describe your electrical requirements. (Will you need any non-standard power supplies or cables?) If you do not have any need of these, please enter NONE. None
Briefly describe any additional equipment or technical requirements you will need. (Items requested for past conferences include projectors, large second monitors and microwaves, for example.) If you do not have any need of these, please enter NONE. None
Will you be using a ticketing system for attendees to interact with your installation? No

Extended Abstract Upload

Extended Abstract Upload: pdf

Representative Image

Representative Image: jpg

Representative Image Comments

Copyright Text, Image Credits, and Comments:

Supplementary Materials (Optional)

File 1:
Optional Representative Image (15MB max - jpeg): jpg
Copyright Text, Image Credits, and Comments:
Supplementary Supporting Document, up to 4 pages (15MB max - pdf):
Supplementary Video, up to 3 minutes and 200MB (mov, mp4, avi, mpg): mp4
Copyright Text, Image Credits, and Comments:
Supplementary Material (50MB max - zip):
Logistics Plan (pdf): pdf
Copyright Text, Image Credits, and Comments:
Video. Strongly recommended for installations. Maximum three-minutes, up to 200MB (mov, mp4, avi, mpg):

SIGGRAPH Promotional Policy Acceptance

I agree to the SIGGRAPH contributor advertising and promotion policies. Yes