Frameless

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2017 Symposium Program

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Friday, Dec. 1

9:00 Opening remarks *David Long Frameless Labs*

9:05 Welcome remarks *Dr. Jeremy Haefner, RIT Provost*

9:15 Keynote 1 "How To Sound Smart About VR, AR and MR At Cocktail Parties"
Wyatt Savarese, The Mill
This talk will explore VR | AR | MR in the post production VFX market.

10:00 Break

10:15 Session 1 "Tangible Experiences"

- **"Immersive Technologies & Museum Functions"** ***Juilee Decker***
  Museums have many functions: to educate, to exhibit, to interpret, to engage, and so on. How do immersive technologies impact these functions? Given that such technologies can extend the continuum of the museum experience and bring visitors from "me" to "we" and from "here" to "there," one may question the need for visiting a site—such as a museum—at all. This talk offers provocations about the deep interest, inspiration, and tactility that can be generated through immersive experiences via place-based augmented devices at museums and place-based sites.

- **"Tangible Imaging Systems"** ***James Ferwerda***
  We are developing tangible imaging systems that enable natural interaction with virtual objects. Tangible imaging systems are based that incorporate electronic displays, graphics hardware, accelerometers, gyroscopes, and digital cameras, in laptop or tablet-shaped form-factors. Custom software on consumer mobile devices allows the orientation of a device and the position of the observer to be tracked in real-time. Using this information, realistic images of three-dimensional objects with complex textures and material properties are rendered to the screen, and tilting or moving in front of the device produces realistic changes in surface lighting and material appearance. In this presentation, we describe four tangible imaging systems we have developed.

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- **"Animated Records"** ***Andrew Tetz***
  "Animated records" are a new take on phenakistoscopes, pre-cinema animation toys that appear as a moving image under the right conditions. Pointing your camera phone at the spinning card under a bright light causes the shutter to blur the frames into a cohesive dancing picture! Drew will describe his new techniques & applications for the pre-cinema phenakistoscope animation style and show live demonstrations.

11:15 Session 2 "Narrative"

- **"Current State of VR Narratives: Some Preliminary Findings"** ***Trent Hergenrader***
  In this talk, Prof Trent Hergenrader (Dept of English) will discuss recent trends in VR narratives. Topics in this short presentation include the challenge of defining different types of VR experiences, an attempt to chart experiences on a scale of interactivity and narrative complexity, and some very early conclusions about the current state of VR narratives and where we may be headed in the future.

- **"Loom: Shadow Stage Visuals For Dance Performances"** ***W. Michelle Harris***
  For the visual backdrop of a concert dance performance that was not only beautifully mood-appropriate, but also dramatically responsive, the motion detection features of the software library OpenCV were an integral part of the solution. Live imagery created with OpenCV's OpticalFlow motion detection object in Processing blended with video imagery controlled by the Isadora application to provide a rich palette of visuals for the "Loom" performance. Echoes of the dancers movement mixed with video imagery and dancers' shadows comingle with vivid stage lighting for a stage environment that complements the dance without overwhelming it.

- **"Audience Perspectives On Viewing Live Performance In Virtual Reality"** ***Joe Geigel***
  For the past two years, we have developed and performed "Farewell to Dawn", a mixed reality dance performance that combines virtual reality, augmented reality, and motion capture to enable presentation on a virtual stage with participants in different physical spaces. This talk will focus on insights that we have gained from the performance with a particular focus on the audience perspective and how we might be able to produce a true theatrical experience for audience members viewing a performance in a virtual space from different physical locales.

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12:15 Lunch

1:15 Keynote 2: Joel Ogden, Construct Studios

- **"Interactive Storytelling in Virtual Reality"**
  Virtual reality is an incredible medium for telling a story, but also presents a unique set of challenges for the storyteller. I will discuss how our team at Construct Studio solved these challenges while developing our recently interactive VR experience, The Price of Freedom. This talk will such topics as: the manipulation of scale to influence a player's emotions, locomotion methods, exploration of character identity and presence, play testing for story understanding, setting a mood in virtual space, and strategies for directing the viewer's attention in the experience.

2:00 Session 3: "Human Exerience/Perception"

- **"Virtual Reality and Language Learning"** ***Kevin Le Bievec***
  Language learning is a constantly evolving field that is changing with the introduction of new and emerging technologies. Instructors and students have become experts in appropriating technologies to be used in and out of class. From online vocabulary cards, to virtual field trips, language learning has embraced technology as a way to expand beyond the regular classroom and create meaningful and authentic experiences. Virtual and augmented reality offer new possibilities for immersive, interactive and collaborative experiences. We will explore how these new tools benefit language learners and what evolutions we may see in the future.

- **"Long Lasting Effects of Auditory Localization Training Using Augmented Reality"** ***Song Hui Chon***
  We present a follow-up study of our auditory localization training with Microsoft HoloLens from last year's symposium. Five participants took part in the training twice a week for four weeks. Their performance was tested four times – before the training began, after the first two weeks, after the completion, and ten weeks after their last training. The result shows that participants'

auditory localization performance significantly increased after the first two weeks, which remained unchanged afterwards. The training effects seem to be strong and long lasting, considering that the average performance did not drop after ten weeks.

- **"Gaze-in-World Classification During Everyday Tasks"** ***Rakshit Kothari***
  The head and eyes function synergetically to provide a stable view of the world. Traditionally, classification of eye movements is performed with the head fixed but increasing naturalistic task demands induce the need to accommodate for head movements. This project highlights the performance of common classification algorithms against the performance of expert human labelers. Furthermore, it introduces a new Forward-Backward Recurrent Window classifier which outperforms other methods.

3:00 Session 4 "Tools for Authorship"

- **"VR Content Creation Graphical User Interface For Product Designers"** ***Johanna Lopez***
  Virtual reality focus has shifted from research to widespread adoption. It has the potential to become an intuitive creation tool, giving the designer an unconstrained and flexible canvas. By reimagining tools for Industrial Designers using virtual reality, the project presented aims to help industrial designers better leverage the contextual environment, make better design choices, be empathetic to users, and communicate design intent. This talk will review virtual reality user interface design guidelines and considerations that may help to seize the immersive potential of the medium.

- **"Alexa in Mixed Reality"** ***Chirag Narendra Kular***
  When we wear the HoloLens, we can play the holograms and place them anywhere in augmented reality. Taking one step further, what if we could interact with holograms like we do now with digital voice assistants such as Cortana, Google Assistant or Amazon Alexa? In this project, we are attempting to put a face to Amazon's Alexa by creating a hologram to interact with without using Echo or Echo Dot.

3:45 Break

4:45 Session 5 "Demo/Poster Reception" w/ food and beverage

- **"Special VR experiences from The Mill"** ***Wyatt Savarese and Cat Gulacsy, The Mill***
  A sampling of VR experiences from special guests and keynote speaker from the Mill. The Mill (http://www.themill.com/) is a collection of artists, technologists and makers for all media, working at the frontiers of visual narrative.

- **"Experiences in building, testing and deploying 360 cameras for generating immersive content"** ***Ambarien Alqadar*** **and** ***Nitin Sampat***
  Students in the School of Photographic Arts and Sciences & School of Film and Animation will share their experiences, challenges, and insights gained from their collaborative work in generating VR content using a variety of technologies including entry level VR 360 cameras such as the Samsung Gear 360, the Theta V to High end cameras (built, tested and deployed by the students) such as the Facebook Surround 360 camera. The booth will also show examples of "spatial audio" and how it gets deployed in 360 applications.

- **"Tangible imaging systems"** ***James Ferwerda***
  We are developing tangible imaging systems that enable natural interaction with virtual objects. Tangible imaging systems are based on consumer mobile devices that incorporate electronic displays, graphics hardware, accelerometers, gyroscopes, and digital cameras, in laptop or tablet-shaped form-factors. In this demo we will show four tangible imaging systems we have developed: the tangiBook – our first implementation on a laptop computer; tangiView – a more refined implementation on a tablet device; tangiPaint – a tangible digital painting application; and phantoView – an application that takes the tangible imaging concept into stereoscopic 3D.

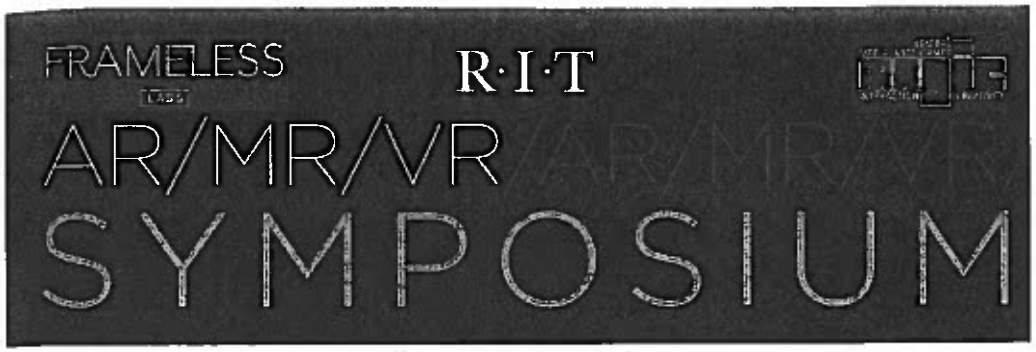
- **"Audience Perspectives on viewing live performance in virtual reality"** ***Joe Geigel***
  For the past two years, we have developed and performed "Farewell to Dawn", a mixed reality dance performance that combines virtual reality, augmented reality, and motion capture to enable presentation on a virtual stage with participants in different physical spaces. In this demo, we will be providing a single viewer experience of a 3d recording of the piece (viewed in an Oculus Rift).

- **POSTER: "Modeling Color Appearance in Augmented Reality"** ***Nargess Hassani***
  In this project, we are present a color appearance model in augmented reality. The model is based on previous light mixture models and current color appearance models (for real objects). For this purpose, there has been measurements and modeling of real, virtual and mixed appearance in AR. A psychophysical experiment was performed, where observers matched virtual color patches on black background to a mixed color patch on a test background under two sets of illuminants. The results of this experiment are used to verify the perceptual predictions of the model.

- **"Virtual Reality app for guided meditation"** ***Abhishek Jaitley***
  The benefits of meditation have long been known and recommended by the medical community. There has been a recent trend in showing the measurable effects meditation has on the brain by viewing brain scans or measuring heart rate during/after meditation. The goal of this virtual reality experience is to evaluate if such an app improves the quality of the meditation by using galvanic skin response (GSR) sensors. GSR measures the skin conductance, which can change due to emotional states. By measuring GSR values we can check what effect an activity has on the emotional state of a person.

- **"VRm"** ***Jesse O'Brien***
  VRm is the prototype for a virtual tool that medical professionals could use to study anatomy. It is an interactive VR simulation of an anatomically correct arm. Users can select parts of the arm and pose it. Muscles can be made opaque/transparent so the skeleton can be seen underneath. When muscles/joints are selected a text box pops up with anatomical information about the selected item. There is a light that the user can move around the scene to view the arm in different lighting conditions. Lastly, there is a white board that the user can write on in the simulation.

- **"VR - Here to Help!"** ***Aishwary Pramanik***
  We present a disaster management educational system in Virtual Reality, which can tell a builder everything about the location into consideration and suggest a better architectural design, which can help them fight the worst disaster/hazard that can occur. Presenting all these things in VR gives the builder greater insight and understanding of the constructional constraints and safety measures.



- **"Connection Capsules"** ***Madeline Stewart***
  Glass pendants contain a note that encourages the transfer of the piece on to an inspiring individual within 24 hours. Each day, the object connects with a new life. It sparks an experience of noticing the inspiring qualities within society, and encourages people to connect with others through the act of recognition and appreciation. The note also contains instructions for documenting the experience through photography and written reflections. This documentation is collected and installed in an exhibit, displaying the impact of the object's journey.

- **"Avatar Fight"** ***Hao Su***
  A virtual reality game that uses hand gestures for flight

- **"Animated Records"** ***Andrew Tetz***
  Demonstrating new techniques & applications for the pre-cinema phenakistoscope animation style. Using turntables & a camera to create the illusion of a moving picture on a number of "animated records." Please see http://bit.ly/animatedrecord

- **"AudioRoom VR"** ***Cody Van De Mark***
  This is a roomscale audio visualizer where the player environment is the visualizer itself. The URL https://www.youtube.com/watch?v=MmTXyyAapAU shows a light proof of concept illustrating that the room itself becomes the audio visualizer. The player can move around the room and interact with objects to change song and modify the experience.

- **"DIY VR: Exploring AR"** ***Ronald P. Vullo, Ph.D.***
  I have been exploring the development of "home-brew" VR (Virtual Reality) headsets for a couple years and am now experimenting with building AR (Augmented Reality) headsets. Very much a work in progress, not an actual product, I'll be sharing my current prototypes and progress.

- **"Autonomous Driving Simulator in VR"** ***Mingming Wang***
  Autonomous driving has the significant potential to positively impact the daily life of humans. Analysis of human perception during the cognitive driving task, while making critical driving decisions, can provide great benefits for the study of the autonomous driving. To achieve such an analysis, we have collected eye movement data of human drivers with a mobile eye tracker when they are driving in an automotive simulator built around an actual physical car, that mimics a

realistic driving experience. The initial data have been utilized to investigate the potential correlation between the driving behaviors and fixation patterns of the human driver.
Note: This demo will be shown in Louise Slaughter Hall (SLA (078) – Room 1440)

- **POSTER: "Color perception in AR"** ***Lili Zhang***
  Studying the color perception in AR head-mounted device

- **"Visual Guidance in VR: UI Design, Testing and User Study"** ***Yebai Zhao***
  This is my capstone research project developed in Unity. The goal of this study is to design a user interface for the main task and two to five different possibilities for displaying supplemental information. Then, perform a rough user study between these approaches in VR HMDs. A comparison between different approaches will be made to find which leads to the most satisfaction.

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PROGRAM

December 1st, 2017