LAIT – Large Group Learning and Experimentation System

A White Paper

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Submitted by

John Toenjes, Associate Professor, Music Director, UIUC Department of Dance

With the assistance of collaborators:

Alan Craig PhD, NCSA Retired, Researcher at iChass

Christopher D. Benson, Associate Professor, Associate Dean, UIUC College of Media

David Marchant, Professor of the Practice, Washington University, St. Louis

Monica McDermott, Associate Professor, UIUC Department of Sociology

Robert E. McGrath PhD, Former Researcher at NCSA

Erica Mott, Choreographer

Tony Reimer, Lecturer, UIUC Department of Theater

Kevin Wise, Associate Professor, Director of Graduate Studies, UIUC Department of Advertising

Kristina Williams, Graduate Research Assistant, GSLIS

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Working Theme

LAIT is a client-server software platform for quickly and efficiently making mobile applications for use in a wide variety of theatrical, informational, and educational situations. Although we have our particular research interests, this project is not targeted at one specific outcome. Rather, we are creating a tool to enable diverse researchers and educators to more easily pursue their goals. LAIT can be a platform for experimenting with content delivery and audience interaction in any environment where learning occurs, thus **directly addressing Grand Challenge #2: designing tools, environments, and platforms to improve/deepen/ accelerate learning, and learning processes and outcomes.** We envision LAIT making a core contribution to partners' projects that need mobile applications as research tools.

Background

LAIT was conceived in Spring 2013 in DANC 451 Dance Technology class, the focus of which was "iPads in dance performance." Mobile apps generally perform only one function, but the class desired an iPad app to perform multiple functions without the need to access a menu. So students created a prototype client/server application system that sends data and graphics wirelessly to iPads on cue, nearly instantly, for use in class performances. This app had obvious potential for the stage, so I incorporated a version that included an audience phone app component, in my dance *Kama Begata Nihilum*.[i] The closeness of the iPads to the bodies of the performers, as well as the connection the audience felt to the performance through their phones, tangibly resonated throughout the theater. At a Q&A session afterwards, one audience member said that he had never felt as connected to, or involved in, a performance as he had during that dance, because of the phone app.

Others approached me with ideas about how to use the app to reach audiences. A friend who is new to classical music wished for some help to figure out what he was hearing in the concert hall. Could it function as a real-time guide to which instruments were playing,

so that he could follow along with the music? It struck me that in addition to augmenting theater, this app could be a powerful learning tool in many different situations.

Thus was born LAIT, the Laboratory for Audience Interactive Technologies. As we began experimenting with various builds, three basic modes of use guided development: display, annotative, and interactive. It became our goal to develop not just a one-off "app," but rather a platform for making apps that could be used in a wide range of theatrical, informational, and educational situations. NCSA was approached to help develop this application system, as it has a history of nurturing cross-disciplinary efforts such as eDREAM[ii], the Illinois Informatics Institute (I3)[iii] and ICHASS[iv], helping institutionalize these units to design and apply digital systems to solve real world problems.

LAIT is an editable mobile development and deployment platform for content delivery and audience interaction in any learning environment: theater, lecture hall, classroom, conference center, concert hall, museum, or outdoor facility. Its utility and flexibility have been tested and proven during the 18 months it has been under development. In workshops at the American College Dance Festival, the University of California-Irvine (UCI), and the University of Illinois Urbana-Champaign (UIUC), it was used as a guide for real-time human interaction within a live role-playing game, and as a means of moving people through a museum-like installation; in the performance of *Public Figure*,[v] it served as a musical scoring and delivery tool, and as an audience cueing, crowd control, and safety information delivery device; and at our "LAITday" workshop,[vi] LAIT delivered the content of the lecture directly to attendee's devices. Content was altered within the app just minutes before these events, showcasing its ability to be quickly customized for different situations.

Software System Details

The LAIT system is a scalable architecture that can be deployed on a wireless network, consisting of servers, a client mobile device app, an editor program, and sockets for

external output/input (for complete details, see Toenjes & Reimer 2015[vii]). The system enables events to be triggered extremely quickly for large numbers of mobile devices—a difficult technical challenge. LAIT implements a Domain Specific Language (DSL—which we call "LAITian"), inspired by theatrical cue lists, that defines the content to be loaded on the mobile device, and the timing and triggers for displays and messages. The DSL is an abstract description of the content, and is the foundation for a visual editing environment for creation and modification of content and desired interactivity. The client app on users' devices is an "open container" for the content and instructions that are dynamically loaded prior to the event. Presenters can put their own content onto audiences' phones, without the need to write a special app, saving time and expense, and offering tremendous flexibility.

LAIT is being developed using the Unity 3D game engine, a proven commercial platform used by game developers worldwide. Unity 3D has a robust scripting layer that allows for extensive customization, along with reliable networking functionality, and support for most mobile operating systems.

Version 2.0 of LAIT will be released in January 2016. This major update will allow 1) more types of media to be delivered with more control (Augmented Reality, enhanced audio and video control), 2) access to more mobile device features (camera, accelerometers), 3) powerful two-way communication capabilities, including a) customized content delivery depending upon audience responses to prompts (such as language choice, demographic information), b) responsiveness to audience preferences (assessed through voting, for example), and c) the ability to send specific content to specific phones. This update will include the ability to gather and store data produced by these responses, and to send data to external systems for aggregation and processing, which could be used by researchers later, or used immediately to influence the way that LAIT responds to the situation at hand. One can only imagine the uses that educators, presenters, and researchers could find for this platform.

Problems, Questions, Opportunities and Positioning

Our white paper working group has identified the following strong areas of application that would position LAIT for further research funding opportunities:

1. Large group interaction (large test populations; crowd reactions; participant studies);
2. Rapid prototyping for application development and testing;
3. Quickly altering content within experimental or learning situations, with consistent presentation among versions;
4. Content delivery and feedback to individuals, or specific groups of people;
5. HCI and Mode(s) of Presentation: studies of efficacy of personal communication through mobile devices, replacement/enhancement of current technologies; psychological attachment to mobile devices; transparency of device leading to stronger connection to material;
6. Performance/Performance Studies: collaborative, audience integration; audience interaction; extra knowledge/different perspectives; change of perception.

LAIT works well in both formal/large group and informal/small group learning environments. Many of these learning environments already have the necessary infrastructure required for users to connect to LAIT. LAIT brings heretofore-not-possible capabilities to large group situations. And LAIT is designed to allow daisy chaining of servers to cover potentially hundreds or thousands of users at one time. Furthermore in these situations, LAIT is able to deliver the same content to all users, or different content to different groups of users, and/or deliver specific content to specific phones, apportioned either arbitrarily, or by a) audience response to instructor queries, or b) location within the venue. LAIT also can gather user input from a large group and immediately shuttle it out to aggregator services for processing. This allows for uses such as voting on a large scale, or for big data gathering on large groups. We can imagine several scenarios that could take advantage of such

capabilities. Two of them are presented in abbreviated form below. (The *Appendix* contains complete details of these scenarios, as well as others that use LAIT in learning studies.)

1. Sociologist Monica McDermott posits a scenario that uses LAIT in testing the effect of self-awareness on responses to increasing racial diversity in the US. This scenario would test positions 1, 2, 3, 4, and 5, above. Research in sociology and social psychology has found that most whites are not consciously aware of their racial identity, which can lead to "colorblind racism." The relative effect of direct and indirect identity salience can be teased out in this study and connected to attitudes.

Four test groups listen to a lecture on increasing diversity, focused on changing demographics in the US, with LAIT pushing graphics and photos of people of color to subjects' phones during the lecture. Some groups take "selfies" prior to the lecture, and some groups receive photos of people of color on their phones during the lecture. Other groups don't take selfies and/or don't receive the photos during the lecture. In each test, students are administered a survey at the end of the talk about their attitudes towards racial inequality and immigration. This study would operationalize white identity salience directly (by the equivalent of seeing one's reflection) rather than just indirectly (via exposure to non-whites). It would provide a direct and immediate activation of this identity via the self-photo.

Prior to the invention of LAIT, these tests would have taken four separate trial sessions. LAIT allows this scenario to occur in one session, with each test group receiving group-specific information via LAIT's ability to customize content delivery based upon "conditionals." Subjects can indicate which group they are in by a button press on the phone screen, then targeted content will be delivered to those specific phones belonging only to that group. Moreover, this study could be further customized and be made more efficient by having each group directly respond to prompts and questions during the lecture, invoking LAIT's ability to track such responses and aggregate them for statistical evaluation. After

evaluation of data, the study could be modified if desired and run again. Alternatively, four complete studies could be run in the same time it otherwise would have taken to run one, with statistical information captured immediately, versus after the fact with a questionnaire.

2. Communications professor Chris Benson posits a scenario that uses LAIT to test awareness and impact of coded language on journalism students, showing how LAIT is adaptable to many different academic disciplines. The outcome would be a teaching model for university classroom use, but also for diversity workshops for media professionals, media literacy workshops, and other presentations and lectures for the public. This scenario would test positions 1, 2, 3, 4, and 5.

In a lecture situation, he would establish a baseline of key word awareness; proceed through a discussion of the effect of expression on social construction and, in turn, mediated reality on attitudes, beliefs, behavior; and then return to "retest" the coded language to gauge responses. The privacy/anonymity of the LAIT system would encourage honest responses. Fascinating possibilities arise by incorporating smart phones. Testing coded language through the app and the relatively anonymous responses of a public group via smartphones (sort of a mini public opinion poll) would open the session. A discussion of the meaning of the terms and their implications would follow, and then a second "test" to measure the growth in critical appraisal of the semantic differential. Finally, LAIT would deliver to the phones "Tweets" and other social media messages aimed at elevating consciousness.

CLICKERS–testing position 5. Some argue that "clickers" already provide the kinds of benefits that LAIT offers, and that using clickers discourages students from engaging in technological multitasking, one of the more widespread forms of distraction lamented by current educators in higher education.[viii] However, LAIT actually fully occupies users' smart devices, discouraging this behavior. Clickers are also limited in the variety of activities available for instructors to implement, as they only offer one-way communication from

device to instructor.[ix] [x] LAIT offers two-way communication, not limited to the multiple-choice use of clickers. Using LAIT would be cheaper and more integrated than clickers, and studies on mobile integration provide a framework upon which LAIT testing could begin.[xi] In one study, integrating mobile applications was compared to introducing a new system into a learning environment,[xii] which caused educators to think about the affordances of specific technologies and how to apply these technologies to improve the learning environment.

LAIT is also suited to informal learning environments, situations that provide education opportunities without having a traditional instructor present. For example, Museum Studies expends a sizeable amount of energy experimenting with mobile technology for the purpose of enhancing user experiences. The use of mobile applications, even as a supplement to predominantly paper-based or website-moderated education, shows an increase in user attention, knowledge gained, and willingness to spend more time learning about exhibits.[xiii] Although we have no museum-studies expert on our panel, examples of scenarios and use within Performance and HCI will be directly addressable to such experiences.

Performance and HCI

Our white paper group contains several performance experts. In this context, we developed scenarios and actual tests to address positions 1, 3, 4, 5, and 6. Two will be described here; see the *Appendix* for the complete list and description of scenarios.

1. During the ILSDI writing period, we used LAIT to place non-dancers within and among performers in a way not otherwise possible, in order to have them experience what it is like to be *in* a stage performance, and expand their knowledge and experience of their sensing abilities. Choreographer and Professor David Marchant created a work for LAIT called *iWe* that was workshopped at UCI, and fully executed at UIUC. An excerpt from the work shows how the audience interacts with the performers with prompts from LAIT ("1:21" refers to the elapsed time of the music, informing the LAIT operator when to trigger a cue):

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Cue 12 - 1:21 Cello + piano (10:18 total running time)

Witness/Participants: Walk among the dancers. Touch them to make them stop, or to make them start moving.

Dancers: Make Individual or Duet Gesture/Shape and Freeze. If touched while moving, freeze. If touched, begin moving.

Participants' feedback after this performance reinforced the experiential learning Marchant had hoped would result. One participant remarked, "Having the instructions [on the phones]…invited the audience into [the dance] in a way that I had never experienced before. [It was] fantastic to be *within* the dancers…and to be aware of your perception of movement without seeing the movement, which is the inversion of how we typically observe dance, where we are in seats and it's just a moving picture in front of us. To be aware of the movement physically, but not to see any of it, was really fantastic!" To use LAIT to enhance the teaching of perception is powerful, indeed.

2. Group behavior/group interaction is an area of study ideally suited to LAIT's capabilities. A (somewhat wild, but fun) scenario offered by former NCSA researcher Bob McGrath investigates pageantry and ritual and how new tools can facilitate this within society, addressing positions 1, 4, 5, and 6–and truly testing the limits of LAIT's capabilities. At half time, the fans are directed by their phones to sing the fight song (also providing lyrics), and are asked to "paint the sky orange" by holding up their devices, which LAIT has turned bright orange. Detecting the overall volume of the singing with the mic, the more people that sing, the brighter the phones glow. If possible, get an airship to fly over with dimmed lights, to see if it can be "painted" orange, and to take aerial photos of the group.

A research area of great interest to this white paper team is the question of how users' relationships to their mobile device affect learning modes and efficacy. Psychological attachments to what originally were termed PDA's—personal digital assistants—have become enmeshed with what Sherry Turkle describes as the "robotic movement"[xiv] to

engender "nomophobia,"[xv] and to spark multiple lines of research into how human behavior and relationships are affected by mobile devices. Questions surrounding the cyborg aspect[xvi] of mobile devices, their embodied nature, and how physical attachment to the device may affect the quality and nature information transmission are deeply important to the field of human computer interaction (HCI). How does Heidegger's concept of "ready to hand," wherein "tools-in-use become phenomenologically transparent"[xvii] through use, come into play in this context? What are psychosocial attitudes towards content received and interactions requested through the device?

We can use LAIT to choreograph experiences that leverage the psychological efficacy of performance, in order to explore the dependencies between the physical and virtual body. Can we awaken awareness to the tool without it 'breaking,' and if so, what are the implications to how we experience our bodies in time and space in the context of the new attachment to digital devices? Our informal research done with groups using LAIT in a performance/workshop setting shows that this aspect of embodied cognition is active in users,[xviii] and is an area we are keen to pursue further, with more rigorous reporting methods.

Future Development & Funding Sources

A variety of ongoing funding programs are relevant to LAIT in general and many of the aforementioned applications in particular.

1. The Cyber-Human Systems (CHS) program is one of three core programs within the National Science Foundation's (NSF) Division of Information and Intelligent Systems. "CHS research applies knowledge of computing and communications together with theoretical and practical understanding of behavioral, social and design sciences to better develop diverse kinds of systems, such as *systems that amplify individual human capabilities through a device or environment that empowers them to improve their performance, achieve their goals, improve well-being and enhance creative expression while assuring that the*

computer is no longer a distraction or an obstacle" (italics ours). Ongoing annual solicitations for small (<$500k), medium ($500k-$1,200k), and large (>$1,200) projects.

2. The Cyber-Physical Systems (CPS) program, also within NSF's Division of Information and Intelligent Systems, describes as its goal "to develop the core system science needed to engineer complex cyber-physical systems which people can use or interact with and depend upon. Furthermore, "To expedite and accelerate the realization of cyber-physical systems in a wide range of applications, the CPS program also supports the development of methods, tools, and hardware and software components based upon these cross-cutting principles, along with validation of the principles via prototypes and testbeds."

3. The Perception, Action, and Cognition program within NSF's Directorate of Social, Behavioral, and Economic Sciences (SBE) supports research on topics including vision, haptics, attention, and reasoning. Ongoing with biannual proposal solicitations.

4. Google sponsors an annual faculty research competition in topics including human-computer interaction, information retrieval, and mobile. All of these topics are potentially relevant to LAIT scenarios.

5. NEH: Digital Projects for the Public ($400K)

6. NSF: Cyberlearning and Future Learning Technologies ($16K–$18 million)

7. NEH: Museums, Libraries, and Cultural Organizations Planning ($50-100K)

8. NEA: OUR TOWN: Arts Engagement, Cultural Planning, and Design Projects

There are a variety of specific funding programs relevant to LAIT, such as:

9. National Park Service: Listen, Feel, and Learn App Research grant ($60K):

10. Prizes to USA, Canada and International Teams for Literacy Software and Apps Aimed at USA Adults ($40K)

Appendix – Scenarios

ILSDI panel members were asked to provide scenarios to imagine uses of LAIT. Presented here are their responses:

1) Monica McDermott, Associate Professor, Sociology, UIUC

In Test #1, a group of students would take "selfies" of themselves with their phone, and then would listen to a lecture on increasing diversity, focused on changing demographics in the US, with graphics and photos of people of color pushed to the students' phones during the lecture. In Test #2, students would not take photos of themselves before the lecture, with graphics and photos pushed to their phones. In Test #3, the lecture would proceed with only tables and graphs–no photos–pushed to the phones. Test #4 would include the "selfies" but no photos pushed to the phones. In each test, students would be administered a survey at the end of the talk about their attitudes towards racial inequality and immigration. The results would indicate the impact of two variables: self-awareness (operationalized by taking photo of self) and exposure to non-whites (via photos) on the relationship of shifting demographics on attitudes (the focus would be on white attitudes, but data for other groups might be interesting, as well).

Research in sociology and social psychology has found that most whites are not consciously aware of their racial identity and that this lack of awareness leads to "colorblind racism," or the belief that race no longer matters in society (hence claims of discrimination are false). Research has also found that white identity is likely to be made salient by exposure to non-whites. It is unclear how salient white identity impacts racial attitudes; in some cases it activates a sense of group threat that leads to more prejudice while in other cases it brings about a sense of shared interests that reduces prejudice. This study would operationalize white identity salience directly (by the equivalent of seeing one's reflection) rather than just indirectly (via exposure to non-whites). The relative effect of direct and indirect identity salience can be teased out in this study and connected to attitudes.

Since non-whites often have, or are assumed to have, salient racial identities, we know less about how an activation of this identity might influence attitudes. This study would provide a direct and immediate activation of this identity via the self-photo.

2) Christopher D. Benson Associate Dean, College of Media, UIUC

My interest in this connection is considering the use of LAIT to test awareness and impact of coded language on journalism students. Basically, in a lecture situation, I would want to establish a baseline of key word awareness; proceed through a discussion of the effect of expression on social construction and, in turn, mediated reality on attitudes, beliefs, behavior; and then return to "retest" the coded language to gauge responses. The privacy/anonymity of the LAIT system would encourage honest responses. The outcome would be a teaching model for university classroom use, but also for use in diversity workshops for media professionals and even media literacy workshops and other presentations and lectures for the public.

While the idea is still in embryo, there are fascinating possibilities with respect to incorporating the smart phones. As I mentioned in my earlier note, a baseline would be set up for gauging recognition and interpretation of certain coded language. In this connection, I am especially interested in language that serves as part of the dynamic process of social construction and the media role in it all. So, racially charged language, as well as terms going to sexism, heterosexism, anti-Semitism, Islamaphobia, xenophobia, class-consciousness and ethnocentrism ("America first") would be key areas of focus. Testing coded language through the app and the relatively anonymous responses of a public group via smartphones (something of a mini public opinion poll) would open the session. A discussion of the meaning of the terms and their implications would follow. Then a second recognition "test" to measure the growth in critical appraisal of the semantic differential would be administered. Finally a suggested list of "Tweets" and other social media messages aimed at elevating

consciousness. One older and really easy example: “Ground Zero Mosque” is a loaded term that ultimately is not even accurate. Given its elements, though, it serves to inflame more than inform. Tweet: “Ground Zero Mosque is not @ Ground Zero and not a mosque.” There is much language out there to be tested and reformed in order to deconstruct, such as “Senseless violence,” “radical Islam,” “Illegal Immigration,” “reverse discrimination, ” etc.

Target Audiences: Media students (and those from other disciplines);
Potential Outcomes: Media literacy and engaged social action.

3) Robert E. McGrath PhD, Former researcher at NCSA

Memorial Stadium Sing Along (Night game)

Description: Fans are invited to load the app (barcode on posters at entry, on screens, and programs?). As part of the half time, singing the loyalty song (or other appropriate point), the audience is asked to “paint the sky orange”. Hold up your device and sing along. The screen glows orange (as long as pointed at the sky?). Detect singing with the mic, the more people singing, the brighter the phone glows. Better effect if stadium lights are dimmed. If possible, get airship to fly over with dimmed lights: see if we can paint it orange.

How LAIT is used: The basic show is trivial: Light up the screen Orange on cue. Fancy wrinkles include: Detect orientation, shine only at the sky, Listen for singing, report “level” of sing along to server, server varies brightness according to participation based on sensing.

Queries: How bright can we get it? How bright would the whole stadium full of phones be? Is it possible to connect controller to stadium lighting, to coordinate dimming as the phones light up? If so, then singing along also controls stadium itself…. Ditto for overhead airship display? Can we get a live satellite view from space?

Principles Demonstrated: Very large scale, will require a ton of network and server capability. Extends and contributes to pageantry and ritual. Riffs off of Block I, existing communal sing along, etc.

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4) Alan Craig PhD – NCSA Retired, Researcher at iChass

A soloist in a jazz ensemble is connected to LAIT via a wireless microphone. The soloist is able to utter thoughts about what they are thinking about while they are improvising their solo. This would be transcribed and pushed to the audience members to help them get some insight into what the soloist is thinking while jamming away. The thing is, I was thinking of my own solo performances and if asked what I'm thinking about, my honest response would have to be (for better or worse) "nothing."

I would be curious if this is the case in general or if they do have a genuine, verbalizable thought process while soloing. If LAIT allowed for communication TO the performer, then the audience could potentially push images to the soloist in an attempt to influence the improvisation. Extending this to a demonstration scenario, one can imagine a surgeon carrying out a surgery while the audience watches to push a stream of consciousness to the audience telling them what she or he is looking at, what they are thinking about, etc. while conducting the demonstration of what they are expert at. Ideally they might have a head mounted camera (Google glass?) with which they can snap photos to push to the audience members so they can see in detail what the surgeon is attending to.

Both of these capabilities (verbal stream of consciousness and could be addressed by a large screen monitor for images and PA system for the stream of consciousness without LAIT. So, what is the benefit of LAIT? One could consider this as input to a student "notebook" in which they could capture live photos and audio clips into the notes they are taking. The LAIT capability is embedded into a student notebook app where they keep their notes, etc. but is active during live demos, etc. so student can save and annotate the media for future reference. The instructor can add new media on the fly in response to student questions, etc.

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5) David Marchant, Professor of the Practice, Washington University, St. Louis

iWe

LAIT Interactive Improvisational Performance Score

David Marchant

Premiere October 23, 2015

University of California–Irvine Dance Department.

Performance Score for Dancers (D) and Witness-Participants (WP)

Set to Music by: Olafur Arnalds, (selected tracks from "Dyad 1909")

Cueing by "LAIT" app for mobile devices, developed by John Toenjes.

Legend

"D:" indicates what Dancers will improvise based on instructions given.

"WP:" indicates what Witness/Participants will do, delivered as LAIT Cues.

Time is when Cue is triggered [Note: time indicated is based in the music's time code for the given track.]

Italics indicate the written instruction they will receive.

Vibration will accompany Every LAIT cue to alert WP of new Cue.

Artists Instructions to WP's:

- Vibration will signal Every Cue to alert you when to look at your device for new instruction.
- If Cued to "*Close your Eyes,*" please keep eyes closed and wait for vibration to open your eyes, then read/follow next instruction.
- Instructions to move through space should be done slowly, gliding smoothly through space with performative quality and presence. The effect should feel like a cinematic slow motion pan or "dolly shot", continuously watching the total scene while moving.
- If uncertain what to do, watch others for help. (Everyone gets the same cues, but note that dancers may be doing something different than WP's)
- Recommended rehearsal: WP's do "dry run" of Cues, without music or dancers, just to preview/rehearse the sequence and clarify things such as how to follow instructions, locations for spatial instructions, and general meanings of Cues so that event can run smoothly without confusion.

Artists Instructions to D's:

- Respond to music quality, mood, dynamics, but not in overly dramatic way.
- Style should be clear, simple authentic.
- Technique OK, but not for mere display or "show off" of virtuosity.
- 5 Dancer Minimum. Ideal Ratio of WP's:D's could be 1:1 up to 3:1. Note: Dancers could increase according to total number of WP's for ideal ratio (i.e. WP's should equal or outnumber dancers)

Track 1 "Fra upphafi"

Scene Cue Cue/Description (total running time)

1. 0:00 Intro (0:00)

Pre-Set

WP: 0:00 *Stand Together in Large Circle & Close Eyes.*

D: 0:00 Take places in circle among WP's.

Music Starts…

WP: 0:24 *Open Your Eyes—Watch Dance* (Vibrate Cue)

D: 1 at a time, run across the open space in random bursts, evolving to include Dramatic gestures, leaps/jumps, bold images while crossing center. Accelerating rate…

WP: 1:10 *Close Your Eyes*

2. 1:11 "Earth Cracking" (1:11)

D/WP: [waiting in stillness]

3. 1:26 Rev. Elect. Sound (1:26)

D/WP: 1:33 *Open Your Eyes--Walk slowly among others*

Track 2 "Lokaou Augunum"

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4. 0:00 Piano Begins (1:47)

D: Make Slow Motion Gestural "Statues" for WPs to walk around, like a gallery exhibit.

5. 0:26 Single violin note (2:13)

D: 0:26 D's all Fall to the ground—Freeze

WP: 0:35 *Return to opening Circle.*

WP: 1:02 Close Your Eyes.

D: After eyes close, Return to Circle, except for Duet who stays in the center.

6. 1:14 violin (3:01)

WP: 1:14 *Open Your Eyes--Walk slowly around Circle.*

D: A Contact Improvisation Duet (other dancers return to circle as well). Optional—Dancers could "round robin" replacing dancer who is in the longest.

WP: 3:04 *Stop Walking*

7. 3:08 "Seeds of Broken.."→ end (4:56)

D: 3:08 Duet holding hands, slowly pulling backwards until hands separate, holding eye contact, while slowly walking backwards to return to Circle.

WP: 3:50 *Close Your Eyes…*

Track 3 "Vio Vorum Sma…"

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8. 0:00 "I remember it well" (5:41)

WP: 0:10 *Open Your Eyes*

D: 0:12 Solo Dancer Lip Syncs the poem in center of the circle, turning slowly in place so that everyone can see it.

9. 0:42 Piano (6:24)

D/WP: 0:42 *Walk across Circle, look someone in the eyes, and tell them a hope or a fear. Then that person will cross to another and continue…*

D/WP: 1:37 *Form a Line, Shoulder to Shoulder*

D: 1:46 In small solos and groups, D's move forward into space to do short, dances, then come back into the line.

D: 2:57 Returning to the line.

WP: 3:05 *Close Your Eyes.*

Track 4 "…og lengra"

10. 0:00 Intro Music (8:57)

D: 0:00 Dancers Make a clumped Group facing the WP Line. Hold Stillness…

11. 0:28 Cello begins (9:25)

D: 0:28 Dancers do group improvisation: flocking, shadowing, contacting, building on unified evolving group theme.

12. 1:21 Cello + piano (10:18)

D: 1:21 Dancers Make Individual or Duet Gesture/Shape and Freeze. If touched while moving, Freeze.If touched, begin moving.

WP: 1:21 *Walk among the dancers. Touch them to to make them stop, or to make them start moving.*

13. 2:41 piano ends (11:40)

D: 2:41 Dancers Move and then Freeze, repeating…

WP: 2:41 *Stop Walking Wherever you are. Close Eyes, Turn to a new view, Open Eyes, Watch. Close Eyes, Turn, Open Eyes, Watch, Repeat…*

D: 3:07 Dancers Fall, get up, fall again, repeating until end….

14. 3:08 Wind, fading… (12:10)

WP: 3:30 *Close Your Eyes…*

[End 3:55 (total running time =12:50)]

Bibliography

Acaroglu, G. (2014). Cyborg presence in narrative theatre. Australasian Drama Studies, 65, 237-254.

Baker, C. (2008). 'Liveness' and 'presence' in bio-networked mobile media performance practices: Emerging perspectives. International Journal of Performance Arts and Digital Media, 4(2&3.), 117-136.

Baker, C. C. (2013). Mindtouch: Embodied mobile media ephemeral transference. Leonardo, 46(3), 221-224.

Boscardin, C., & Penuel, W. (2012). Exploring Benefits of audience-response systems on learning: A review of the literature. Academic Psychiatry, 36(5)

Bragazzi, N. L., & Del Puente, G. (2014). A proposal for including nomophobia in the new DSM-V. Psychology Research and Behavior Management, 7, 155-160.

Brey, P. (2000). Technology as extension of human faculties. Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology, 19

Chang, K., Chang, C., Hou, H., Sung, Y., Chao, H., & Lee, C. (2014). Development and behavioral pattern analysis of a mobile guide system with augmented reality for painting appreciation instruction in an art museum. Computers & Education, 71, 185-197.

Chesher, C. (2007). Becoming the milky way: Mobile phones and actor networks at a U2 concert. Continuum: Journal of Media & Cultural Studies, 21(2), 217-225.

Chuang, Y. (2015). SSCLS: A smartphone-supported collaborative learning system. Telematics & Informatics, 32(3), 463-474.

Coleman, E.,. (2013). Technology innovation and improvisation: Rhetoric and reality. Educause Review, 48(4), 8-9.

Guthrie, C. F. (2013). Smart technology and the moral life. Ethics & Behavior, 23(4), 324-337.

Huei-Tse Hou, Sheng-Yi Wu, Peng-Chun Lin, Yao-Ting Sung, Jhe-Wei Lin, & Kuo-En Chang. (2014). A blended mobile learning environment for museum learning. Journal of Educational Technology & Society, 17(2), 207-218.

Jarrett, K., & Devine, M. A. (2010). How to use backchanneling in your classroom. Education Digest: Essential Readings Condensed for Quick Review, 76(1), 41-44.

Keengwe, J. (2015). Promoting active learning through the integration of mobile and ubiquitous technologies. Hershey, PA, USA: IGI Global.

Morrell, L. J., & Joyce, D. A. (2015). Interactive lectures: Clickers or personal devices? version 1; referees: 2 approved]. F1000research, 4(64)

Owen, C. B., & Rebenitsch, A. (2014). Integrating the audience into a theatre performance using mobile devices. International Journal of Pervasive Computing and Communications, 10(1), 4-5-26.

Pierce, T. (2009). Social anxiety and technology: Face-to-face communication versus technological communication among teens. Computers in Human Behavior, 25(6), 1367-1372.

Santos, I. M. (2015). Mobile devices in higher education classrooms: Challenges and opportunities. In J. Keengwe (Ed.), Promoting active learning through the integration of mobile and ubiquitous technologies (pp. 37-54). Hershey, PA: IGI Global.

Smith, B. K. 1., bsmith@drexel.edu. (2014). Bodystorming mobile learning experiences. TechTrends: Linking Research & Practice to Improve Learning, 58(1), 71-76.

Spence, J., Frohlich, D., & Andrews, S. (2013). Performative experience design: Where autobiographical performance and human–computer interaction meet. Digital Creativity, 24(2), 96-110.

Stowell, J. R. (2015). Use of clickers vs. mobile devices for classroom polling. Computers & Education, 82, 329-334.

Tools are 'temporary body parts'. (2009). Retrieved 10/5, 2015, from http://news.bbc.co.uk/go/pr/fr/-/2/hi/science/nature/8112873.stm

Turkle, S. (2011). The tethered self: Technology reinvents intimacy and solitude. Continuing Higher Education Review, 75, 28-31.

Turkle, S. (2015). How to teach in an age of distraction. Chronicle of Higher Education, 62(6), 1-1.

Voelkel, S., & Bennett, D. (2014). New uses for a familiar technology: Introducing mobile phone polling in large classes. Innovations in Education and Teaching International, 51(1), 46-58.

Yildirim, C., caglar@iastate.edu, & Correia, A., acorreia@iastate.edu. (2015). Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. Computers in Human Behavior, 49, 130-137.

End Notes

[i] Krannert Center for the Performing Arts' Colwell Playhouse, February 6-8, 2014, as part of the University of Illinois Department of Dance production February Dance.
[ii] http://edream.illinois.edu/
[iii] https://www.informatics.illinois.edu/
[iv] http://ichass.illinois.edu/
[v] University of California-Irvine Experimental Media Performance Lab (xMPL), October 23-24, 2015. http://www.arts.uci.edu/event/guest-artist-performance-series-john-toenjes
[vi] An informational and brainstorming session was held at the Krannert Center for the Performing Arts on May 1, 2014, in order to introduce LAIT to the community and to seek ideas for its use. Details at http://lait.ncsa.illinois.edu/lait-day-on-may-day/
[vii] "LAIT – The Laboratory for Audience Interactive Technologies: Don't "Turn it Off" — "Turn it On!" Proceedings of the 21st International Symposium on Electronic Art, (http://isea2015.org/proceeding/submissions/ISEA2015_submission_62.pdf)
[viii] Santos, Leda M. "Mobile Devices in Higher Education Classrooms: Challenges and Opportunities." Promoting Active Learning through the Integration of Mobile and Ubiquitous Technologies IGI Global pp. 37-54.
[ix] Morrell, Lesley J., Domino A Joyce. Interactive lectures: Clickers or personal devices? F1000Research 2015, Vol. 4.
[x] Stowell, Jeffrey R. "Use of clickers vs. mobile devices for classroom polling." Computers & Education, Vol. 82, pp. 329-334.
[xi] Voelkel, Susanne and Daimark Bennett. " New uses for a familiar technology: introducing mobile phone polling in large classes." Innovations in Education and Teaching International, Vol. 51, pp. 46-58.
[xii] Chuang, Yung-Ting. "SSCLS: A Smartphone-Supported Collaborative Learning System," Telematics and Informatics, Vol. 32, pp. 463-474.
[xiii] Hou, Huei-Tse, Wu, Sheng-Yi, Lin, Peng-Chun, Sung, Yao-Ting, Lin, Jhe-Wei, Chang, Kuo-En, "A Blended Mobile Learning Environment for Museum Learning," Educational Technology & Society Vol. 17, pp. 207-218.
[xiv] Turkle, Sherry. Alone Together: Why We Expect More from Technology and Less from Each Other Basic Books: 2011
[xv] Caglar Yildirim, Ana-Paula Correia. "Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire." Computers in Human Behavior, Vol 49, pp. 130-137
[xvi] Haraway, Donna, "A Cyborg Manifesto: Science, technology and socialist-feminism in the late twentieth century," The Cyber Cultures Reader, Routledge, 2000, pp. 291-324.
[xvii] Wheeler, Michael, "Martin Heidegger", The Stanford Encyclopedia of Philosophy (Fall 2015 Edition), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/archives/fall2015/entries/heidegger/>.
[xviii] See quotation from participant in *iWe*, above.