The context of the research-creation project
Rather than using technology as an instrument for measuring time is it possible to create an interactive environment that uses technology as an organic means for altering its perception?

Saint Augustine once said, *"God did not create the world in time but with time."* I am inspired by this proposition as it clearly describes my desire to create a responsive environment that challenges our perception of time, while steering clear of crafting clockwork like installations simply made up of regions of mimetic time. This avenue of investigation and hybridization, which combines theatrical techniques and new technology, holds the promise of changing not only the way we design responsive environments but how we create new conceptual frameworks and devise strategies for affecting how these responsive environments are experienced.

My creative process and practice has always involved the expression of *time* as a single element amongst many. As a choreographer, film maker and trans-disciplinary artist, I have used temporality as a tool for creating dynamic structures for my work that generate context from content and that develop, sustain and embrace the traditional relationship between performer, observer and the separate space that each occupies. However, over the past ten years my fascination with time has moved beyond its vicarious use within live performance towards an embracing of the first person experience.

Recent technological advances, in sensor design and the ways in which data can be collected and manipulated, now make it possible to apply some of the same techniques that art practitioner's use in performance, to the interactions that take place within a responsive environment. However, rather than using these techniques to suspend the *observer'*s disbelief, they can be employed to effectively suspend the *participant's* disbelief on an experiential level. Increases in computational speeds mean that narrative and theatrical artifice can now be applied, in real-time, enriching the participant's lived experience within this newly imagined technologically enhanced environment. In terms of our proposed project this means that we will be able to move beyond the convention of expressing time as an elaborate collection of artefacts or illustrations that depict the many speeds at which it passes, as in Christian Marclay's cinematic timepiece *The Clock* (2010), and instead design an environment/exhibit that treats time as an experience rather than a measurement.

Henri Bergson criticized the notion of time articulated by the emerging technologies of cinema as the union of instants – *cinematic time*. For Bergson, we experience time not as instants, but as duration (1922; 1999). Contemporary composer John Cage once explained, "Of the four characteristics of sound, only duration involves both sound and silence" (1973: 63). Theatre director's Robert Lepage (b. 1957) and Peter Brook (b. 1925) also recognize how by simply governing the ways in which an experience unfolds they are able to create works that transcend linear time as framed by cause and effect. Forty years in the performing arts has taught me the importance of understanding the difference between time and duration and how to control not only *what people see and experience* but also *how they see and experience it*. For example I discovered early on, that choreography is not about the *body in motion* but about *how the body moves* when in motion. As an artist I have used the human body, light, shadow, spatial relationships, and acoustic design to provide the observer with a rich tapestry of image and sound. While all these elements create, support and sustain the aesthetic framework within which a work of art evolves, the power to communicate ideas and converse with an audience lie in *how* these elements are woven together.

In much the same way, the research that I have been conducting along with students and affiliate faculty at the Topological Media Lab (TML), has revealed that to move beyond creating responsive environments that are more than just a set of observable phenomenon we need to place as much emphasis on *how an interaction transpires* as we now place on creating the elements that define *what transpires*. Rather than delivering and then supporting a single outcome, recent experiments have shown that controlling the *how* opens a window to the participant's imagination, which in turn creates the potential for many different types of experiences to exist at any one time.

When successful, the interacting elements that make up this type of responsive environment are shaped in the mind of the participant and therefore are no longer directly tied to a single action, quality or feature of the environment.

In the field of new media and responsive art, technology has generally been used in three ways: to create content, to transmit that content and to trigger the human-machine interaction. While the modular use of technology, as a set of tools, was important to the developmental evolution of interactive media in performance, it is time to take a closer look at how we will advance the technical and conceptual design of the responsive environment of the future. What we are proposing is a departure from thinking of interactive media as a component based medium. The *InTime* research-creation project is the product of years of committed research that has looked at new ways in which responsive media could be designed and used to create and shape content from the interaction itself. This is important to the advancement of research in the design of new forms of interactions within the field of responsive media because it places the focus on what is experienced through interaction rather than on the pre-recorded special effects generated by the interaction. Our engagement with this line of inquiry has already led to the design of interactive instruments, which have real world applications outside their artistic use. One example is our current project with the Children's Hospital Foundation of Montreal, *Interactive Environments and Play*.

The objectives of the research process-creation

Our objectives are: (1) to create time-conditioning installations or living environments embodying alternative modes of time (2) Refine and develop techniques, instruments and compositional paradigms for modulating time-based media and its experience within interactive environments, (3) mentor designers and artists to explore and create their own environments using these new paradigms for conditioning the sense and textures of time.

In an effort to create and cultivate a culture of wonder and awe, the commercial/pseudo artistic use of technology such as Moment Factory, or Disneyland, has been fixated on painting the exterior facade of the world we live in. In these instances the sole motivation seems to be to use technology, projected images and distributed sound to fabricate virtual constructions that offer little more than a means of superficially affecting the visceral relationship we have with our surroundings. In other words we experience the tool, rather that the content or environment they were meant to create.

Interactive technology is everywhere from the voice recognition systems on the phone, to the way that automobiles use responsive media to park themselves. Clearly we need to recognize that, as media artists and researchers we need to move beyond the use of technology as a way of replacing our human interaction with the world and broaden our understanding of how technology can be used to *enhance our experience of the world*. If not, technology will gradually separate us from our physical environment by replacing natural interaction with spectacle.

With *InTime* we will use this evolved understanding of responsive media, to move beyond the use of technology as a means of camouflaging naive artistic expressions of altered states of *time.* We will evolve new methods and systems within which the potential for all types of temporality can be experienced. We will accomplish this objective by building upon the expertise and experience of our team members, the results from several years of joint collaborations and the documented outcomes from our FQRSC funded *Einstein's Dream* (2012)**.**

As an artist-researcher, I am trained to imagine and create works of art fashioned from a finely crafted combination of fabricated logic, the theatrical manipulation of space and time, and a composed and balanced mixture of illusion and interactivity. Building on this deep understanding of artistic process our cutting edge installations will be housed within an environment evolved from a mature and profound understanding of how to create a human experience. What makes this possible, in terms of the technical side of our project, is the manner in which our systems are designed to evolve over time. In our built environment each interaction and the qualities that define their presence and effect their distribution through the space are in constant flux based on the variables created from the data that is

captured from across the entire exhibit. Unlike other responsive environments where the interaction is tied to a repetitive cycle of call and response, our installations will never react or interact in exactly the same way twice. More than just a programed series of coupled interactions our exhibit is fashioned from a complex combination of human and machine interaction giving it the capacity to develop behaviour. For example data collected from interactions that occur between participants and an installation in one part of the exhibit as well as interactions between the technical components of the installations themselves is distributed across all parts of the exhibit. This effectively changes how the environment in one part of the installation responds based on the data generated by an interaction in another part of the exhibit; ensuring that if the same action were to be repeated more than once the outcome would be different each time. The fact that our built environments can evolve over time addresses one of the greatest challenges our team faces, which is how to treat *time* as the intimate experience it is. We understand, based on past experience, that even though a group of individuals may populate the same part of our installation at any given moment, no two people will experience the unfolding of the event in quite the same way. While this represents a substantial challenge, in terms of the installation's dynamic and technical structure, it is also what will make the exhibit so remarkable. In fact using today's advanced technology we can easily track hundreds of people at a time. We can treat them all as individuals or as grouping of individuals or even both at the same time. Where they congregate, distinctive gestures, the rhythm of their walk, the direction they move in, the patterns that arrive from the layering of these directions, the sound of their voices, the semantic clusters that are revealed in conversations, all generate data that has the potential to effect how the installation/environment behaves. This makes for an exhibit that supports the individual experience within an environment that reacts like an artificial ecology governed by the lived experiences and interactions of the constituents that inhabit it. With a mixture of chance, possibility and the unexpected, our responsive environment will, like live performance, provide each participant with the agency and opportunity of using their imagination to invent their own experience within the artificially generated reality we have crafted.

    InTime is supported by an internationally recognized team of artists, researchers and academics whose line of enquiry and practice involve the use, manipulation, and perception of time. Navid Navab is an interactive sound designer whose compositional skills and research and development of responsive sound environments are known and respected on international stage for their intelligence and sensitivity. Jerome Delapierre is an interactive visual designer recognized for his cutting edge use of imagery and its innovative application within live performance and contemporary art installations. Dr. David Morris' interests are in phenomenology with a focus on the philosophy of the body, mind and nature in relation to current biology and cognitive science. His work on, reversibility, expression and perception make him an essential member of our team

Demonstrate the originality of the project or program of research-creation
    The uniqueness of *Intime* is expressed in every phase of the project: from the research question that generated the conceptual foundation, to the processes we've designed to support and sustain the novel yet succinct exploration of our subject matter, right up to the way in which the dynamic and aesthetic structures of our exhibit are informed and inspired by the rigor and projected outcomes of our investigation. In response to the importance we have placed on developing new approaches and techniques related to both the pursuit as well as the dissemination of knowledge, we have adopted procedures that we believe capture and combine the best practices of scientific investigation and artistic inquiry. In terms of methodology, experience has taught us that it is in the grey-areas that exist within the overlapping procedural borders of art and science that hold the most promise for our collaborative work. With this in mind we will employ a trans-disciplinary approach modelled on a collective laboratory practice dedicated to building responsive environments around whole experiences rather than isolated phenomenon.

Over the past several years we have been actively exploring a number of unique levels of human and machine interaction and as such have begun looking at ways of modifying various stages of traditional investigatory practice. These include but are not limited to, pure research, the creative and innovative application of learned methods and techniques, and the development and refinement of design and construction. We have also realized that given the nature of our projects, all research-creation objectives need to be housed in an environment that, at all times, remains sensitive and receptive to the results of public outcomes. In response to these prerequisites we have come up with some innovative solutions on how our working environment should be structured and organized. Within this newly imagined research setting, that is both studio and lab, we can now look towards developing new lines of enquiry that both examine and apply artistic techniques and methods within an environment that doubles as rehearsal and experimental platform. Concepts and outcomes are imagined, conceived, explored, developed and transformed into public exhibits within a lab-studio space that is equipped with fully operational models of our interactive systems and instruments. In a sense our research takes place inside the interactive environment we are building, which on a conceptual and technical level, means that we are in continuous creative dialogue with what we are designing. Physically surrounded and immersed in our work, our responsive installations evolve as a direct consequence of our daily interaction with the technology we are developing. This type of creative process is unique because it is driven by the fusion of theory, imagination, and the practical and daily encounters with what is being made.

Also while most research groups are strong in one area: technology, art, or philosophy, we aspire to collectively be strong in each, hence the balanced emphases on modes of reading, discussion, design, coding, and making. In this way we combine technical depth and precision, tempered by social and philosophical maturity, while remaining sensitive to poetic effect. The fact that we are informed beyond what is prescribed by our area of expertise means that we share and understand the research from multiple perspectives. Our process is deepened and our work enriched by the simple fact that we provide individuals with the space and security to think outside their discipline and do not divide researchers into groupings of those who imagine and those who do not.

The process and steps of the research-creation program

In order to achieve our objectives it will be important that the process mirror not only the many diverse features of our proposed project but their relational value and weight within the whole of its conceptual vision. This requires that we focus, in tandem, on the research and development of the instruments that support interaction within our responsive environment; the refinement of these instruments through observational and reflective analyses; the development of each of the individual interactive installations; the modification of these individual installations based on its role within the whole of the exhibit; and finally the event design. All of these procedural phases are cocooned in a philosophical and creative process that ensures we engage with our research as art rather than as a psychological experiment. This is key if we are to remain true to the inspired exploration of time consciousness as an experience rather than and observed phenomenon.

Both the proposed schedule and budget estimates are grounded in our deep understanding and years of experience in: (1) leading theoretical and practical research within a lab setting, (2) the dissemination of that research and acquired knowledge inside and outside academia, and (3) the artistic creation and production of large-scale events.

2015-2016: Research and prototypes
- Initial research on temporality and interactivity
- Seminar: For the entire academic year, the seminar will discuss phenomenological readings on temporality, architecture, performing arts, and digital media. This will be lead by a two-year

Postdoc fellow, Harry Smoak, under the title of "Philosophy, Performing Arts, and Technology" to be supervised by Dr. David Morris

- Development of prototypes
- Exploration Residency**:** In the Hexagram Black-Box, we will take part in a one month exploratory residency with developed prototypes. We will investigate how installations connect related to human and machine interaction. TML students, professional artists, philosophers, theatre designers, and neuroscientists, will be invited to the residency workshop.

2016-2017: Time-conditioning installation construction

- Visiting Artists: acclaimed architect and designer Philip Beesley will be invited. We will organize a practical, hands-on workshop on architectural design, construction, and collective building.
- Seminar: Readings and topics to be determined. Again, lead by the two-year TML Postdoc and supervised by Dr. David Morris
- Exhibitions: Our intention is to present *Intime* at Arizona State University's, *2016 Emerge Festival*. Attached is a letter from the Synthesis Center, ASU, with whom we share collective research in interactive technology and temporality. We plan to use the *Synthesis Centre's* prominence as a research lab at ASU as the foundation for a joint application to Emerge Festival. I also plan to exhibit as part of the newly restructured Hexagram Network, specifically engaging with the research clusters around embodiment and movement (see attached letter of support).

2017-2018: Large-scale production

- Finalization of techniques, equipment, and built structures.
- Explore how installations will connect within contiguous spaces.
- Exhibition: Because *Intime* is composed of multiple interconnected installations we will prepare for the final production to be hosted in two different sites: Usine C **(**Centre for creative and multidisciplinary presentation), and one in a public satellite location (to be determined).

The impact of *Intime* on the development/renewal of the artistic domain concerned

One does not have to look far to unearth research-creation projects that use technology as a way of accessing and engaging with the senses. For example there are many artists who use technology to create amazing works such as Robert Wechsler's dance-music devices for disabled people (2010-14), or Philip Beesley's, stunning responsive architectural designs (2014). While these works of art are important and innovative in their own rite they are built using technological instruments that only have a single point of interaction and therefore one specific artistic use. Though they can be viewed or experienced from a number of different perspectives, *what they look like* and their *capacity to shape an experience* does not evolve over time. Fundamentally they remain the same from the day they are installed to the day they are removed.

As a direct consequence of past research our proposal looks at installing our interactive instruments and systems within architecturally contiguous spaces and then looking for new areas of investigation in the fertile ground that exists within the interactive overlap of individual installations. Initial research has revealed that this type of layering leads to stimulating and thought- provoking outcomes, which in turn have led to an enhanced and more comprehensive understanding of how we can create responsive environments rich in experiential potential. Several examples of our techniques, methods and outcomes are provided on our submitted website portfolio in the form of videos, photos and technical descriptions.

What makes this important to the development/renewal of the artistic domain is that our responsive environment is built on potential. Not only does it fulfill its original artistic objective, it can also be used by other artists as a creative platform for future exploration and expression. By design it will not be tied to any particular artistic discipline or consigned to only servicing one particular aesthetic. Instead its

inner workings will be assembled around a technologically flexible backbone capable of rendering and bringing to life our proposed exhibit on time perception and delivering an equally tangible and important platform on which future works of art could be sketched.

The dissemination plan and external financing

Many of the project collaborators are members of the Topological Media Lab and therefore much of our proposed project will take place in the lab's research space. Under my co-direction, the TML continues to serve as an important platform for discussion and a venue for innovative practice based research. TML has become a home for faculty and student researchers interested in combining art and technology and a conduit through which we share research without restriction. Under the umbrella of the TML, with the *Intime* project we will enjoy the privilege of daily contact and creative engagement with designers, theorists and artists from a broad spectrum of disciplines. We will use these exchanges as a means of identifying, expressing and articulating different exploratory paths around the subject of *time* as defined by its poetic and practical application within different disciplines. Because the *Intime* project will involve a lot of student members from the TML, I plan to design a special topics course for fine arts and interdisciplinary students at Concordia. This course would be on "Creative Practices in Responsive Environments," and will aim to provide the opportunity for new students to participate in the large-scale installation component of the research project.

We also have a network of diverse research centres that can provide complementary contexts and ensembles of expertise with which our research program can develop significantly beyond its own initial design. Hexagram (international network of research-creation in media arts, design, technology and Digital Culture) will also support the project by providing access to its international network of artists and scholars, as well as equipment and space. Faculty, students and the general public will be invited to the Hexagram Black box facility for yearly outcomes that are designed to expose and test our research. We will also present interim results in the relevant journals and professional conferences, and as installation-performances for peer practitioners, theorists, and the general public. I plan to tour installations in national and international art venues, and have already begun preparing an application for the 2016-17 Venice Biennale.

As in the past we will seek financial and in-kind support from private companies and individuals. We will look towards developing co-production relationships with galleries, contemporary museums and likeminded institutions as means of offsetting the costs associate with the production and dissemination of the final exhibit. Recently, I received a facilities optimization grant for the TML from Concordia University's Office of the Vice President, Research and Graduate Studies. From this fund, I have earmarked cash contributions for any equipment required for the *Intime* project, and will look to Concordia University for their continued support of our research through other internal grants, discretionary funds, and dissemination opportunities.

Works Cited

Cage, John. "Forerunners of Modern Music" in *Silence: Lectures and Writings.* Wesleyan University
    Press: Middletown, 1973: 63.
Beesley, Philip. *Philip Beesley Architect Inc.* University of Waterloo School of Architecture, Toronto.
    2014. Web. 07 Oct. 2014.
Bergson, Henri and Mark Lewis. *Duration and Simultaneity*: Bergson and the Einsteinian Universe
    (1922). Trans. Leon Jacobson. "Philosophy of Science Series." Manchester: Clinamen Press, 1999.
Marclay, Christian. *The Clock.* 2010. Single-channel video. White Cube Mason's Yard, London.
Montanaro, Michael and Sha Xin Wei. *Einstein's Dreams.* 2012. Responsive environment installation.
    Hexagram Black Box, Montreal.
Wechsler, Robert. *Robert Wechsler MotionComposer Project.* 2010-14. Palindrome Dance Company,
    Weimar, Germany. Web. 07 Oct. 2014.