LOI For Phase 2 Projects / Subprojects template

Completed Letters of Intent (LOIs) should be sent as email attachments to applications@grand-nce.ca with "GRAND Phase 2 LOI" as the subject line.

A successful proposal will address problems of significant relevance to the GRAND research program and must meet all of the guidelines for projects within GRAND, including the following mandatory requirements:

- The project must address significant research issues relevant to one or more of the GRAND Challenges identified for Phase 2 of the GRAND NCE
- The Project Leader and Co-leader must work at different universities; often they will represent multiple disciplinary approaches, appropriate to the project.
- There must be at least three researchers (including the Project Leader and Co-leader) who are or are eligible to be Principal Network Investigators within the GRAND NCE.
- There must be at least one Project Champion personally involved in planning and carrying out the project who is affiliated with a current or potential GRAND Partner drawn from the receptor community.
- One or more Partners from the receptor community must commit to making significant cash or in-kind contributions to the project.
- A current NSERC Form 100, SSHRC CV, or CIHR Common CV for both the Project Leader and Co-leader must be submitted as attachments to the LOI. Failure to include these attachments will be cause for immediate rejection.

Detailed instructions for completing this LOI template are on Page 2. More information on Phase 2 of the GRAND NCE is available on the GRAND website at the following URL, which will be updated with links to additional information as it becomes available: http://grand-nce.ca/renewal

Please note: If you complete this form using Preview, do not enter more text than is visible within the dimensions of the provided text box. Text that exceeds the visible limits will not be reviewed.

Project Title and Description	○ Full project LOI ○ Subproject only LOI
Title of proposed project MOVITA: New Directions in Moving Image Technology and Aesthetics	
Brief description for public use MOVITA addresses the technologies, creative directions, and social practices that determine how entertainment products and services are made and experienced. Multiple approaches are necessary for such a complex subject: technology development, artistic creation, perceptual testing, social construction, media analysis and scholarship. This work will result in the development of new forms and platforms for media, as well as the tools and products to support them, in collaboration with Canadian companies.	

Proposed Project Leader	☑ Form 100, SSHRC CV, or CIHR CCV has been attached
Name Maria Lantin	Email mlantin@ecuad.ca
University Emily Carr University of Art + Design	Title/Position Director of Research

Proposed Project Co-leader	☑ Form 100, SSHRC CV, or CIHR CCV has been attached
Name Jim Bizzocchi	Email jimbiz@sfu.ca
University (must be different from Project Leader) Simon Fraser University	Title/Position Associate Professor

Proposed Project Champion	○ Confirmed ○ Contacted ○ Not Yet Contacted
Name Jim Slevinsky	Email jim_slevinsky@telus.com
Organization Telus	Title/Position Director, Technology Strategy

Part A: Receptors and Partners list up to six organizations

Organization	Confirmed	Contacted	Not yet contacted
Telus	◉	○	○

Brief description of involvement

Telus funds both Emily Carr University and UBC with cash contributions for research into moving image technology and processing with a particular interest towards topics that would impact IPTV quality of experience. They take an active interest and stay in regular contact through emails, phone calls and site visits.

Organization	Confirmed	Contacted	Not yet contacted
National Film Board of Canada	○	○	◉

Brief description of involvement

In its recent Strategic Plan, the NFB highlights its desire to "...form partnerships with institutes that are working at the cutting edge of creation, for the purposes of exchange and debate." This is in the context of a stated intention to be at the forefront of innovation in both new forms and delivery approaches. We hope to confirm a relationship by the fall of 2013, starting with this focus on knowledge-sharing, and potentially leading to co-creation projects in future years.

Organization	Confirmed	Contacted	Not yet contacted
Canadian Broadcasting Corporation (NewsWorld)	◉	○	○

Brief description of involvement

CBC NewsWorld has provided access to its extensive archive of video as a contribution to Ladly and Penn's work in developing a new interactive system for viewers to search and view material on their own terms within an immersive environment. As this work continues to evolve and expand within MOVITA, the relationship will continue.

Organization	Confirmed	Contacted	Not yet contacted
Christie Projectors	◉	○	○

Brief description of involvement

Christie is the industrial partner with Wilcox and Allison for a 3-year NSERC CUI-I2I grant. They are contributing cash and in-kind resources to that project (including staff involvement). We expect that they will also be interested in learning about the results of other research that is part of the MOVITA project as that work proceeds. If they demonstrate interest in any of the GRAND funded results, we may explore with them a more formal relationship to expand and support the work.

Organization	Confirmed	Contacted	Not yet contacted
nGrain	○	◉	○

Brief description of involvement

nGrain has shown interest in the use of stereoscopic 3D and related interactivity strategies for the visualization of Big Data. We have had one meeting with them and will continue the conversation about how we might share our mutual expertise.

Organization	Confirmed	Contacted	Not yet contacted
Janro Software (SANDDE)	◉	○	○

Brief description of involvement

Janro is supporting the use and development of their drawing tools by Sujir and Mudur with cash and in-kind contributions in the form of hardware, software, and staff support. This relationship has been on-going for a few years, and Janro is currently the industry partner for an NSERC grant related to the project.

Part B: Relations to existing and proposed projects in the GRAND NCE

Related Current Projects

AESTHVIS; VIRTPRES; SHRDSP; PLAYPR; AMBAID; NEWS; AFEVAL

Related LOIs

We are aware that AESTHVIS, PLAYPR, NEWS and VIRTPRES are preparing LOIs.

Part C: Additional Co-Applicants List up to nine additional co-applicants		
Name Laurie Wilcox	Email lwilcox@yorku.ca	☐ Project Champion ☑ Researcher
Organization York University	Title/Position Associate Professor	
Name Panos Nasiopoulos	Email panosn@ece.ubc.ca	☐ Project Champion ☑ Researcher
Organization University of British Columbia	Title/Position Professor/Director, ICICS	
Name Tom Calvert	Email tom@sfu.ca	☐ Project Champion ☑ Researcher
Organization Simon Fraser University	Title/Position Professor Emeritus	
Name Catherine Richards	Email richards@uottawa.ca	☐ Project Champion ☑ Researcher
Organization University of Ottawa	Title/Position Professor	
Name Leila Sujir	Email sujir@alcor.concordia.ca	☐ Project Champion ☑ Researcher
Organization Concordia University	Title/Position Associate Professor	
Name Rob Allison	Email allison@cse.yorku.ca	☐ Project Champion ☑ Researcher
Organization York University	Title/Position Associate Professor	
Name Martha Ladly	Email mladly@ocadu.ca	☐ Project Champion ☑ Researcher
Organization Ontario College of Art and Design University	Title/Position Professor/Assoc. Dean Grad Studies	
Name David Clark	Email dclark@nscad.ca	☐ Project Champion ☑ Researcher
Organization Nova Scotia College of Art and Design	Title/Position Associate Professor	
Name Wolfgang Stuerzlinger	Email wolfgang@cse.yorku.ca	☐ Project Champion ☑ Researcher
Organization York University	Title/Position Professor	

Part D: Summarize the problem being solved (1/2 page)

The cultural and creative industries operate in a context of rapidly changing technologies for content production, delivery, and display. The producers and consumers of content are also changing and are often interchangeable. Moving image content is available in many different forms and on many different displays and devices. Cloud storage, networked machines, social media applications and new business models have created a disruptive environment with opportunities for new players and challenges for old. As always, the issue of quality of experience is crucial to content producers; Is the audience seeing their content in the way it is meant to be seen for each individual platform? Of particular concern are bandwidth constraints which force compression decisions. Display sizes and formats also may not conform to the original content design. Further compounding these issues are the consistently rising expectation of audiences for content with higher fidelity, whether in time (frame rates), or space (pixels, multiview), or colour reproduction. With each improvement to these parameters and with each new display method, often driven by technology providers, the content creators are inspired to create content that highlights the new capabilities. Though inspired, at the beginning creators are often stymied by a lack of (affordable) software or hardware tools, a steep learning curve, and the lack of a connected community of like-minded explorers. The entertainment industry has had a quality of boom and bust in Canada with variations across provinces marked by competition induced by tax credits fluctuations. While this issue is complex and cannot be addressed by research alone, a strong focus on innovation and training of HQP in this sector will attract more investment and retention or relocation of companies to Canada. BC has expertise in 2D-3D conversion and 3D visual effects. The S3D Centre in BC and 3DFLIC in Ontario are closely linked to local companies and have ties to international counterparts. Both have a dual mandate of research and education with an emphasis on building community for the purpose of knowledge sharing and co-creation. The Centre for Applied Creativity in Halifax is committed to engaging with the burgeoning industry in the East. By supporting local independent producers with new and accessible tools we can keep Canada on the map of innovative film and video production, games, and interactive digital media.

To summarize, the problem is that the distribution and production of content will always have to contend with changes in capture and display technologies, and vice versa. They influence each other, creating audiences and new aesthetic challenges in the process.

Part E: Summarize the proposed solution and approach (1 ½ pages)

There will never be a permanent solution to this problem. Rather than calling it a problem, we qualify it as a situation that creates opportunities for evolving collaborative solutions by researchers in science, art and design. The team we have put together has a good mix of artists and scientists with extensive experience in digital media, particularly the moving image. We collectively have expertise in HCI (Stuerzlinger, Calvert, Nasiopoulos), Perception (Wilcox, Allison), post-production (Lantin), narrative and aesthetics (Richards, Sujir, Bizzocchi, Lantin, Ladly, Clark), technology and algorithms (Nasiopoulos, Lantin). Many have current or past collaborations, and all are familiar with the work of the others. For example, Lantin has active collaborations with Sujir and Richards. Members of the 3DFLIC and S3D Centre have attended and organized joint events and have used each other's contacts to build capacity and reach.

A central tenet of the group is to stay attuned to the needs of the receptor community. This community includes:
* Content producers
* Content distributors
* Technology engineers
* Post-Production companies
* Marketers
* Artists

We achieve this by holding events that bring together the different sectors, creating a list of interested members and reaching out to them through different channels (emails, LinkedIn, Twitter, web). We attend and present at industry events and trade shows. We also specifically target companies that are new to the region. We publish white papers and communicate research results through traditional academic channels as well as social media, and exhibits. The S3D Centre recently launched the Canadian Chapter of the International 3D Society. This chapter will have a board of directors composed of stakeholders across Canada (chairing of the board is currently shared by Rory Armes, CEO of Gener8; and James Stewart, founder of Geneva Film Co.)

Part E: Summarize the proposed solution and approach (continued, but only for full project LOIs)

The methodologies employed are varied across the problem domain and will include:
Scientific experimentation
Using methodologies from Human Computer Interaction and Computer Science, we create and test algorithms, and study physiological and perceptual effects of varying moving image parameters (stereo/multiview/HFR/VFR), and new ways of interacting with such content. As much as possible (unless restricted by prior agreements) we share raw data and preliminary results with other members of the group. In some cases data gathered from one group for one purpose can be re-used for another group's purpose. For example, both York and Emily Carr are studying aspects of High Frame Rate (HFR) capture and display. The clips gathered can be shared across institutions.

Research and Creation methodologies
Research and Creation refers to a methodology which mixes scholarly and artistic activities for the purpose of discovery and knowledge creation. There is no single entry point into this methodology and one typically delineates the problem with open-ended questions such as "how does Variable Frame Rate affect narrative? Does it make sense to map frame rate to narrative structure much like one would map colour or sound?" The questions are investigated by searching out the full context of the questions (socio-political, design, perceptual, art theoretical, etc.), identifying effective design decisions instantiated within exemplary works and creating artwork to reflect the findings and to prompt more questions. The iterative process typically produces many outputs including essays and papers, artwork, performances, designs. The process is one of reflection, study, and creative production. The use of this methodology in digital media often requires new processes, new tools, new technologies or the unanticipated uses of existing technologies. In this way, innovation can be triggered by thinking critically about the possibilities of new media.

Play (Building/Creating/Testing)
This approach is a pure curiosity-driven process where we play or create new technology or tools to become familiar with what is possible. The goal is one of surprise. We play so we come across unexpected outcomes and find out which questions to ask. These outcomes then feed into other more structured methodologies, or become prototypes that we can further develop and test. An example of this approach is immersing oneself into augmented reality for an extended period of time to fully understand the repercussions and creative opportunities of being exposed to a stereo signal superimposed on the present. Without the experiential base, it would be impossible to ask the right questions.

Our team has a strong balance of expertise across multiple disciplines, and all of our work involves close collaboration among scientific, engineering, social science, humanities and creative approaches. In addition to the team members, the work often involves other collaborations as opportunity permits, for example Sudhir Mudur's work (NSERC funded) with Sujir, and involvement of 3DFlic artists like Ali Kazimi.

Examples of our previous work in MOVITA include:
* The study of the impact of vertical disparity on speech perception (Wilcox, Allison).
* The development of new, more accurate algorithms for the measure of stereoscopic quality preservation under different compression methods and settings (Nasiopoulos).
* The development of a gestural interface using Vicon for the 3D drawing program, Sandde (Sujir, Mudur).
* The creation of a variable frame rate (VFR) short film for the exploration of frame rate as a narrative parameter (Lantin).
* The creation of multiple rigs for stereo capture including and underwater housing, and POV head-mounted rig (Lantin).

MOVITA has received cash contributions from Telus and Christie, and in-kind or equipment contributions from many others including CBC Newsworld, GestureTek, Janro Imaging Labs, Atomized, and Watervision. We have also been supported by NRC IRAP, MITACS, SSHRC, and NSERC.

The leader and co-leader of MOVITA encourage collaboration between the members of the group, and with other projects by regularly sharing on the mailing lists, connecting grad students that have similar interests, doing lab visits, and co-organizing events.

Part F: Subprojects list up to six subprojects that will be undertaken in the first two years (only for full project LOIs).

Subproject Name (1)

Research, Creation, and Play with Advanced Techniques (S3D, HFR, HDR, VR)

Summary

This subproject broadly looks at the ways in which new techniques and technologies in the Moving Image sector impact image creation and apprehension. Examples include SSHRC funded research creation project "Shivering - research and creation of quasi-objects" (Richards, Lantin) which features experiments with stereoscopic or volumetric projection on fog; experimentation with multi-view capture, display, and interactivity for various platforms (Lantin, Nasiopoulos); experiments with AR to examine the potential of the widespread use of this technology to lead to crowd-sourced stereo content, and how different sources will be able to be blended (present+generated+shared+archived content); development of new filmmaking rigs to explore novel point of view or parameters of capture (multi-view, lightfields, time-lapse); best practices for 3D interfaces for interactive content (Stuerzlinger); continued development of gestural interfaces for the creation of 3D animated drawings (Sujir, Lantin); production of S3D ambient video and related production tools and techniques (Bizzocchi); systematic analysis of exemplary S3D cinema to identify and organize best creative practices in S3D composition, lighting, sequencing and visual effects (Bizzocchi); development of generative algorithms for 3D geometry, patterns, and textures (Mould). This sub-project often feeds and/or benefits from other sub-projects as new methods or processes are discovered to warrant further investigation with other methodologies.

Subproject Name (2)

Vision and perception

Summary

This sub-project looks at the impact of new moving image technologies on human vision and perception. User studies are designed and performed to answer questions under these themes:
*S3D Attention:
How does the 3rd dimension influence the perception of change across scenes?
How is attention distributed? Does stereo content affect content retention? (this would have impacts for education and marketing)
*Frame Rate and other capture Parameters:
Do users have a preference for certain frame rates and shutter angles? What is the variance in preference?
Does frame rate influence viewer comfort and perceptual phenomena such as the uncanny valley?
Are there interactions between frame rate and flash rate protocols? What would be the perceptual consequences?
*S3D film grammar:
How does the existing film grammar change to integrate s3d? For example, why are short cuts or fast pans considered undesirable?
Are there other transitions possible that we have not explored yet?

Subproject Name (3)

New Narrative Forms

Summary

Storytelling is a powerful cultural, social, and economic force. Our research activities will analyze and create innovative digital platforms for narrative expression and experience. Initial focus will examine methods for building narrative meaning within unstructured bodies of video clips. Bizzocchi will expand and refine his SSHRC-supported computational system for the tagging, selection, presentation, and sequencing of separate video clips. His revised software will incorporate increased semantic coherence and improved visual flow to create an "open documentary" system that can be used by individual artists or participant communities. Ladly and Penn will introduce new elements to their keyword-based search system (initially created through the NEWS project in Phase I) to present NewsWorld clips within an immersive environment facilitated through a gestural interface (provided by GestureTek). This new work will investigate critical questions related to the narrativized database, interaction design, technology choice, and effective taxonomy construction/implementation. Clark will contribute through continued development of his series of innovative networked narrative works. He will focus on non-linear narrative structures, the relationship of archive and plot, user navigation, the changing role of narrative time in interactive experiences, and transmedia storytelling techniques. The comparisons of all of these approaches and findings will build a broader understanding of the wide range of possibilities for digital storytelling.

Part F: Subprojects (continued, only for full project LOIs)

Subproject Name (4)

Immersive Spaces and Community Engagement

Summary

This sub-project will examine the design and effect of moving images on large screens in shared spaces - both actual public spaces and networked virtual spaces. Bizzocchi and Hennessey are working with HQP Fortin to examine the ongoing design and development of the technologically mediated "Quartier des Spectacles" in Montreal. They will work with builders, designers, civic, and community groups to examine the relationship of the cultural, political, and economic factors that collectively shape this development. They will be paying particular attention to the relationship between technology, interaction, and mediated representation in the shaping of individual and shared experience within this form of public space that often incorporates the use of individual mobile devices as interface. Clark is working on similar issues in virtual - and historical - space. He will be building virtual simulations - and extensions - of the seminal large-screen installations from Expo 67 in Montreal. He also explores the relationship of shared space and imagery on smaller hand-held screens, and the role of sound in creating and augmenting immersive spaces. Stuerzlinger is working on technologies for inexpensive fully immersive VR setups, i.e., CAVEs that have mainstream applications. Shared outcomes from both research/creation directions will include increased understanding of the dynamics of content selection and creation, visual aesthetics, architectural context, community, interaction modalities, networked multiple screens, spatial navigation, and overall experience.

Subproject Name (5)

Tools and Analysis for Moving Image Quality of Experience (QoE)

Summary

Nasiopoulis, Calvert and Lantin are analyzing the variables which could influence the QoE of a viewer in a variety of different reception contexts.

Questions include:
*How will variable and high frame rates affect the compression algorithms currently in use for live broadcast or IPTV? How will these new compression techniques affect the perception and comfort of viewing 3D content.
*How can we retarget content for different viewing platforms (tablet, phone, eyewear displays, autostereo screens, big screens) with minimal loss of the author's creative intention?
*What is the influence of display parameters on the perceptual experience of viewers of 3D stereo in large theatres?

Subproject Name (6)

Summary

Part G: Summarize how the proposed project will pursue knowledge and technology exchange and exploitation activities within the context of GRAND.

MOVITA has a strong history of providing venues for knowledge exchange with industry, related researchers, and content creators. We will continue the efforts of ECUAD (Lantin) through the S3D Centre, York (Wilcox) through 3DFLFIC, and Concordia (Sujir) through Hexagram, to engage with these communities. NSCAD's Centre for Applied Creativity adds a fourth locale for these efforts in working with receptor communities across Canada. The relationships provide a two-way knowledge exchange that both highlights results and technologies developed by MOVITA to industry and also channels industry concerns and issues to MOVITA researchers to drive further work.

In addition, we will expand activities through proposed partnerships with the CMPA-BC and NFB. Bizzocchi's SSHRC-funded collaboration with MIT's Open Documentary Lab research group will support on-going interactions among HQP and researchers at MIT with MOVITA's HQP and researchers working on the New Narrative Forms sub-project. We are also planning sometime in the next year to propose a new SSHRC-funded workshop project to bring together a select group of researchers, creators, and industry leaders to look at the topic of Advanced Cinema.

Part H: Summarize how the project will network with other projects within GRAND.

We see that many existing projects are exploring similar research questions to MOVITA, and we have noted these in Part B above. However, their research plans and objectives are focused towards a different user/receptor community. For example, some groups are addressing healthcare (patients and providers), others are directed to educators and learners, some to cultural institutions. This is precisely what we would expect with GRAND, and it provides a fertile ground for sharing and leveraging results across projects. What we have learned from our colleagues is that they each define the discrete problems and issues in a different way than we do. This creates the opportunity for good complementarity of the combined research agendas. At MOVITA we want to expand the roles of our HQP to reach out to these projects and find ways to come together when and where the opportunity arises – perhaps even with shared publications. MOVITA has a unique skillset with its diverse research team to take prototype tools/interface concepts from others and utilize/redesign for creative works. Some of the scientific results or technological tools we create may also find a use within a different receptor group. We would like to see more fluid interactions across projects, which potentially might result in a researcher or HQP 'embedding' within another group for short periods of time, as interests and timing coincide.

Part I: Summarize how one or more current or potential GRAND partners will be engaged in and benefit from the proposed research.

Existing relationships with companies, like Christie, GestureTek and Telus, will continue to provide channels for directly addressing industry-driven problems as well as opportunities for moving research results from concept/prototype to products and services. Working relationships with smaller Canadian companies, like Janro Imaging (3D drawing tool) and Watervisions (underwater cinematography), will contribute to the ability of these firms to compete in the increasingly global business of media.

Over the course of the project, we want to increase both our larger company partners and our small company partners (particularly in the content area). We will do this by building in a follow-up outreach component to our knowledge-sharing activities that seeks to identify 'project champions' for each sub-project. These champions will be engaged on a direct basis to meet and discuss research plans with the researchers and help guide future efforts.

Part J: GRAND Challenges Check all that apply and briefly describe anticipated impact	
Entertainment ◉ Primary impact ○ Secondary impact ○ N/A	No matter what technologies appear, or how social and cultural practices evolve, people will want to tell and experience stories. MOVITA will offer Canadians the opportunity to be ahead of the curve as mobile technology, pervasive and increasingly large screens, cloud-based and crowd-sourced media, multi-sensory interfaces and displays, and the merging of real and virtual spaces change the face of the global entertainment business.
Learning ○ Primary impact ○ Secondary impact ◉ N/A	
Healthcare ○ Primary impact ○ Secondary impact ◉ N/A	
Sustainability ○ Primary impact ○ Secondary impact ◉ N/A	
Big Data ○ Primary impact ◉ Secondary impact ○ N/A	MOVITA integrates issues related to 'big data' in two ways: by developing tools for gathering and utilizing data from social media applications and interactions as content and navigational elements for digital media stories; and by examining the use of large databases of video content to fuel new platforms for generative and interactive media.
Work ○ Primary impact ○ Secondary impact ◉ N/A	
Citizenship ○ Primary impact ◉ Secondary impact ○ N/A	The moving image is ubiquitous, spurred by embedded cameras in handheld devices and sprinkled throughout our everyday environments. Our new civic relationship to crowd-sourced material is evidenced by the recent allegation that Rob Ford is using illegal drugs. We can no longer solely rely on a journalist's word. We need to see the video. There is room for MOVITA to contribute creative approaches to this Challenge by taking a long view towards the possible impact of emerging media.
Other ○ Primary impact ○ Secondary impact ○ N/A	