

Comparative Models: Banff New Media Institute and the Digital Media Research and Innovation Institute

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A Time of Transformation

Shaped by the context and opportunity the international Banff New Media Institute was for fifteen years, an epicenter that brought together leaders from the arts, sciences, engineering and technology. My presentation in part draws from the publication *Euphoria & Dystopia: The Banff New Media Institute Dialogues* that Dr. Sarah Cook and I produced (2011, Banff Centre Press and Riverside Architectural Press). The period of the early '90s through to 2005 saw intensive technological change:

- The massive adoption of “new media” and its normalization as “digital media”;
- The rise, fall, and re-emergence of an information-, technology-, and communication-boom economy;
- The impacts of Moore’s law which drove memory capacity, processing speed, and sensor precision up at an exponential rate.
- The globalization of digital tools and content, as well as increases in digital engagement in Eastern Europe, Brazil, India, China, and the African continent.
- The emergence of utopian fictions that proposed the transformation of individual identities into a new collectivity free from prejudice and material need.
- The emergence of social media in forms such as blogging, chat, and instant messaging, bringing millions of people into the digital world.
- The adoption of E-learning as standard fare in colleges and universities in many countries worldwide.
- The concept of collaboration became the watchword of research, invaded creative practices, and challenged ideas about authorship.
- The impacts of mobile telephony transformed family life, public space, political activism, and youth culture, and made 24/7 availability a reality. Privacy began to erode as a principle as well as a practice.
- The embedding of sensor systems and radio-frequency identification tags gave birth to the “Internet of things”.

The Premise of the Banff New Media Institute

The context of dramatic change of the 1990s and early 21st century underscored the role and potential of creativity, artistic invention and collaboration. Fundamental to the ethos of the BNMI was the insistence that artists and designers should be advanced users of technologies and inventors of technologies. Believing that “all forms of technology are designed,” the BNMI sought to provide

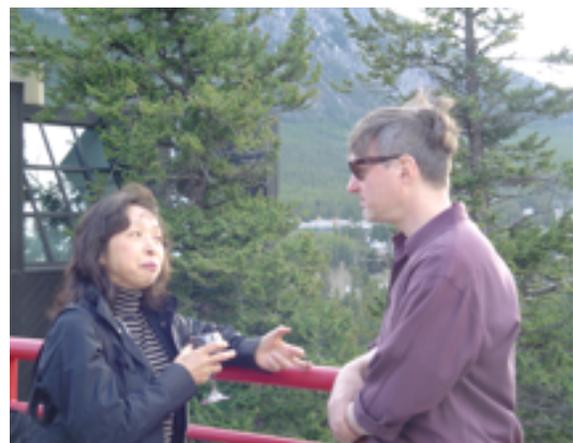
cultural, humanist and post-humanist (recognizing the power and importance of non-human agency) perspectives on technology research and development-design from the perspectives of human culture and respect for the natural world.

The Setting

A neutral and trusted institution situated in the awe-inspiring wilderness of the Rocky Mountains The Banff Centre was able to bring opposing viewpoints and practices into play regarding the digital revolution—utopian and dystopian, resistant and corporate, creative and technological. The BNMI was located within the larger Media and Visual Arts Program of The Banff Centre, which included artists’ residencies, the Walter Phillips Gallery, the Banff International Curatorial Institute, work study opportunities and partnered on technological and laboratory infrastructure. BNMI leadership was ultimately responsible for encouraging creative research practices across all program areas of The Banff Centre.

The Banff Centre was a place of historical power, as an ancient location of indigenous hunting, social gathering, ceremony and exchange for the Stoneys, and Kootenay, Tsuu, T’ina, Kainai, Peigans, and Siksika peoples. Over the course of the development of the BNMI the Aboriginal Arts Program developed at The Banff Centre providing a means to explore this ancient history in contemporary media terms.

The BNMI emerged as a space for action-driven dialogue, a “third space”, initially by default as funding for “new media” research ebbed and then by purpose, as research and infrastructure rebuilt and discourse became productive of networks, ideas and projects in its own right. As Mark Muller states, a third space that acts as “the border or boundary region between two domains—two spaces—is often a region of overlap or hybridity.” (Homi Bhabha, *The Location of Culture*, London: Routledge, 1994) The experimentation within the BNMI built on artists’ residencies such as the Bioapparatus at The Banff Centre and the Art and Virtual Environments project which commissioned substantive virtual reality works.



ArtSci, SciArt, Art+Technology

Over the decades that the BNMI spanned, the terms ArtSci or SciArt were interchangeable, representing the value of equitable engagement between the arts and sciences in research-creation efforts. ArtSci practices bring together artists and scientists in collaborative efforts, each benefiting from their own process of discovery, creating new kinds of conjoined knowledge and expressions. ArtSci also inferred engagement with philosophy and methods that bridged and hybridized art and science. These co-creations focused on the digital and post-digital (brain waves, body processes, environmental science, bioart and nanotech and art). Summits at the BNMI explored these fields. The BNMI was not able to provide a technology infrastructure to support these collaborations but featured these in summits and workshops such as *Carbon vs Silicon: Thinking Small/Thinking Fast* (2003) (nanoart and nanotech). As well, the publication www.Horizonzero.ca offered theorizations of these practices, online representation and commissions.

Side by side with ArtSci were practices in Art + Technology. These collaborations focused on digital tools and creativity, with the goal of producing both art works and technologies that served artists. (See for example Matthew Fuller's 2007 *Media Ecologies: Materialist Energies in Art and Technology*. Cambridge, MA: MIT Press. In these practices the BNMI sought to share agency between artists, scientists, computer scientists, engineers, designers, and industry talent who were engaged in digital invention.

The BNMI goal was to facilitate artists' access to and understanding of not only standard digital tools but to the art and science edges, where access was far more difficult to attain – virtual reality research laboratories, sensor technologies, biotechnology, and nanotechnology.

If ArtSci goals were discovery, with Art + Technology the goals were equally art and new kinds of tools and interfaces that would transform our experience of technology.

These terms may well be obsolete in an era of ubiquitous technology, the integration of advanced digital methods into art making and the art world, and the presence of SciArt experimentation within university faculties. Nonetheless, this period set precedents that built on early art and science and art and technology collaborations in other institutions and times.

The Banff Method

The Banff New Media Institute assumed a set of characteristics:

- High-energy encounters at the frontier of science, art and technology.
- Fast-prototyping projects to evolve new media beyond the expected and the usual.
- Fearlessness – participants in the BNMI shared their knowledge and admitted their ignorance and took personal, physical and professional risks.
- Programs were riddled with language games, physical and verbal ice-breakers, teasers, design challenges and game-play meant to solve problems through participatory design.
- There were hikes in the mountains, ski outings, themed social activities and attendance at Banff Centre cultural events.

- There was always a social evening at Sara Diamond's home that included dinner and refreshments, dancing, a long walk around Canmore by and across the roaring Bow River, seasonal badminton on the lawn, a dip in the hot tub for those who desired as well as chatter on the front yard gazebo.



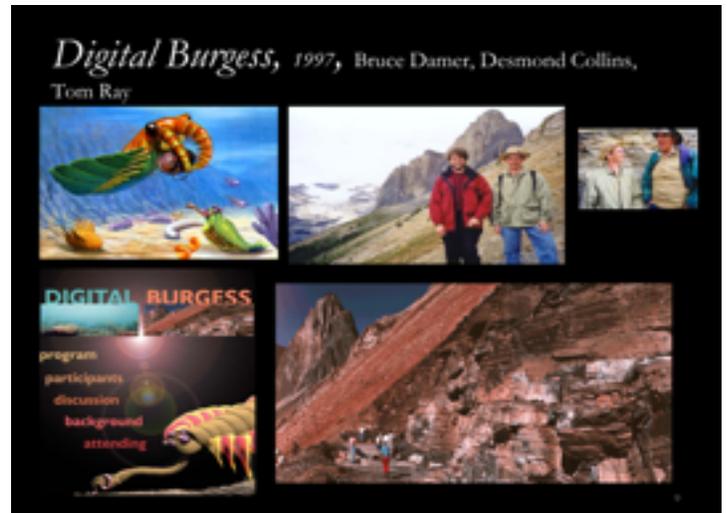
Programs

The BNMI developed a series of programs that represented varied levels of immersion and catered to different audiences. These proceeded side by side with artistic residencies which often also featured digital media, new media and SciArt participants who engaged with the summits and workshops. The program from 2005 – 2010 included: Summits / Workshops; Interactive Screen; The Banff Centre presents the Banff Television Festival; Co-productions; Research (A.R.T. labs); International activities. In 2010 a number of residencies developed which supported thematic exploration of new media as well as doctoral dissertation preparation.

Summits

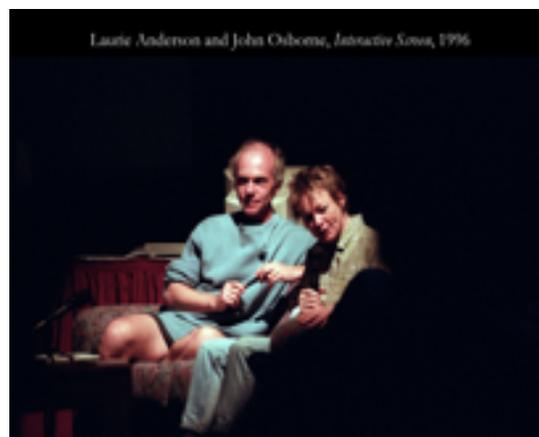
Banff summits began as a means to think forward (what would now be described as foresight exploration and design thinking) about emerging technology and creative trends. Summits were also a means for The Banff Centre to engage with and influence new media creative practices and ideas while it refreshed its laboratories and project funding. The first summit was the *Summer Summit at the Summit* (1997) and was created with Real World, UK to gain an understanding of the state of research, creativity and industry in the emerging new media world. It provided a framework for future summits including *Out of the Box* which focused on physical computing and was supported by the Canadian Social Sciences and Humanities Research Council. Over time summits developed three annual directions – forecasting “weak signals” or more distant emergent practice; mid-term and immediate trends and immediate strategies and opportunities. The goals were to speculate, analyze and inaugurate networks, projects and analysis. BNMI summits were often the first conference like activities to develop analyses of new forms or emerging technologies. For example, *Big Game Hunters* (1998) began a process of analyzing computer-game genres and experiences, and of identifying methodologies with which to approach computer-game analysis. The summit set the framework for

future games-studies events and publications. *Growing Things* (2000) initiated discussions about bio-art and ethics. *Re:refresh!* (2005) began an ongoing series of conferences on the history of media art, science and technology.



Interactive Screen

From its inception the BNMI made a commitment to work towards a viable digital economy that would include support of creative practices, makers and economies. Emerging during the heated dotcom boom the BNMI had strong connections to Silicon Valley, British and EU new media industry and Canadian efforts to build digital capacity. *Interactive Screen* began in 1995 in partnership with Canada's Alliance Media, bringing together screen and television writers and directors with virtual reality, computer games and new media artists and technologists. The goal was to inspire the adoption and blending of these mutually exclusive forms. By 1996, the BNMI had linked with Real World, Microsoft, a host of other companies and Telefilm Canada to present the event. *Interactive Screen* became a forum for project development and pitching and the exploration of monetization of new media, copyright and patent law. Ultimately, *Interactive Screen* brought together creative makers and producers and combined intensive project brainstorming, charrettes, critical dialogue, and during the allied *Money and Law* workshop production and legal advice. It became the backbone of the BNMI. Over the years BNMI integrated debates regarding alternate forms of distribution and value exchange, including open source, free software, file sharing, hackathons, etc.



Media Industries and Digital Adoption

The BNMI engaged television directors, producers, broadcasters, and distributors on two fronts:

- It sought to create awareness about the digital revolution and support a transition that could integrate emerging platforms with television and other traditional industries.
- It sought an environment that could engage with creative makers and support their voices in the mainstream media.

The primary site of engagement was with the Banff Television Festival where BNMI organized the digital media streams with support from Telefilm Canada and other partners. Over the years these included spotlights on gaming, interactive fiction, and development of the WWW, mobile technology and media. BNMI became a programmer for European, Latin American and British new media events where it presented creative new media projects, organized debates and raised awareness of emerging trends and economies. It undertook this work in a time when there was skepticism about the possible impacts of digital change on traditional industries.



Coproduction

BNMI supported creative independent television and then independent new media through workshops, work studies and co-production. A comprehensive co-production program began in the mid-'90s, growing from its initial roots in The Banff Centre's Television and Video program.

It spanned video art and installation, cultural television (dance, opera, and theatrical shorts), documentary, and all manner of commercial and artistic new-media projects. Over 200 original works were created through the support of the BNMI. The BNMI was a partner of the Interactive Project Laboratory, a national bilingual incubator for new media creative or technology projects with commercial potential with financial support from CTVBellGlobeMedia, developed in partnership with the Habitat New Media Lab at the Canadian Film Centre, and the L'Institut national de l'image et du son in Montreal. Companies that won the entry competition participated in workshops

at Banff, the Canadian Film Centre's Habitat and L'INIS and took advantage of residencies at three locations.



Research

The BNMI emerged out of a brief but fecund early history of research at The Banff Centre that included virtual reality, digital audio and authoring tools and was supported by Canadian Heritage in the early 1990s. This funded receded and was in part replaced by commercial funding through the Stentor telco network with research investigating 3D technology on the emerging WWW.

Research capacity waned as funding diminished and laboratory facilities aged. However, by 2003 the BNMI had successfully funded a refreshed sophisticated infrastructure. The Advanced Research Technology Labs (A.R.T. Labs) launched, and sustained ongoing research-creation at BNMI, through in-house research and the hosting of artists' and researchers' residencies. Research focus spanned three themes:

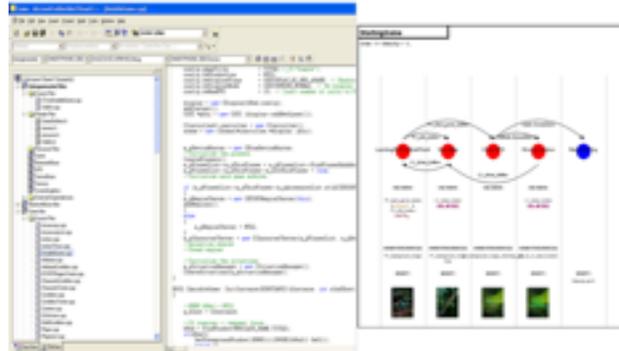
- 3D visualization - the BNMI had moved from virtual reality to interest in data visualization, including in virtual reality/3D contexts. A full CAVE infrastructure include visualization and virtual-reality software;
- A collaboration laboratory included state of the art video conferencing and software development capacities including high-end graphics software to enable games development and educational collaboration;
- A state of the art mobile engineering and physical computing laboratory able to support early Internet of Things, wearable technology, engineering and all manner of mobile technology.



Research included collaborations with the University of Calgary which co-led course in visualization and Human Computer Interaction, residencies on the part of artists and collectives working in these technologies and many workshops. The most significant research in the period of 2002-2006 was funded through the Heritage Canada New Media Research Networks. These were multi-year grants that supported the Mobile Digital Commons Network and the Am-I-Able Network. Banff co-led these initiatives with Concordia University (MDCN) and Concordia and Simon Fraser University (Am-I-Able). These grants included technology companies such as Nokia and HP Labs and involved international collaborations. Outputs spanned prototypes, interventions, exhibitions, conferences and publications. Heritage Canada stepped in to form these networks when the National Centres of Excellence program failed to support digital media research. CANARIE, providing high speed connectivity across Canada, also funded creative research (games, e-learning) in order to emerge and test technology. It is important to note that the two Heritage Canada networks laid the foundation for the National Centre of Excellence GRAND (Graphics, Animation and New Media) which was a \$25,000,000 research network that operated for five years across Canadian universities, with some connection to art and design schools. <http://www.grand-nce.ca/>



MDCN, MEE ENGINE: Authoring System



Did research succeed at the BNMI?

BNMI's great challenges were threefold:

- To manage a balance between in-house research and accessing its facilities to other researchers.
- To maintain funding for projects.
- To maintain funding for skilled staff.
- To upgrade its technology to attract researchers and allow partnerships.

These were acute issues because technology requires constant upgrading, and expert personnel who in turn required funding sources for support. When Banff dedicated resources or external funding supported lab development and management there were highly productive periods of research activity through the BNMI. These periods included the *Art and Virtual Environments Project* which preceded the BNMI and was supported by Interval Research and Heritage Canada and during the later networks discussed earlier. Visiting researchers programs were successful, supporting individuals who were on sabbatical and could work in the labs. Projects such as *CodeZebraOS* which were led by members of the BNMI staff and externally funded, also included many other artists and technology researchers and were supported through in-kind technology as part of the co-production ethos of The Banff Centre. The Banff Centre encouraged Artistic Directors to pursue their creative practice. However, the legacy of the BNMI lies more in its impactful and generative role in creating research collaborations and conclusions that lay outside of its walls, and in small scale co-production projects, than research generated within its labs. Currently the BNMI infrastructure lies fallow.



International Activities

The BNMI defined its mandate and location as residing both in a sublime natural setting and through our international collaborative networks. In the late 1990s the BNMI began to develop off-site events and collaborations which brought its experimental and collaborative methods and prototyping activities to places around the world. BNMI leaders often presented its work in Brazil, Cuba, Estonia, Finland, Australia, the UK, Mexico, the Netherlands, France, China, and the USA. BNMI collaborated with documentary producer Peter Wintonnick to offer *Windows on the Real*, in 2002 in Adelaide, Australia, examining documentary practices and digital disruption. BNMI assumed a co-producer role with events such as *Crossover* (2001) and *Crossover Studio: In a Wild Place* (2002) at White Oak Plantation, Florida modeled on *Interactive Screen*. The BNMI collaborated with the Dak'Art Biennial of African, Sylviane Diop and Waru Studios and featured a new media workshop and exchange of Canadian African diasporic artists, indigenous artists and curators. Over the decade BNMI forged powerful relationships and collaborations with Brazilian virtual reality designers and architects, new media artists, computer scientists and theorists. In 1998 BNMI co-created a conference in Fortaleza, working with Patricia Martin¹ and the Brazilian film industry. A plan to create a shared laboratory at the Gabriel Garcia Marques Film School was scuttled by the Helms-Burton Act embargo, and the Microsoft acquisition of SoftImage, as they withdrew their role as underwriters. With funding from the Finnish government it created a series of think tanks on the future of mobile platforms and technologies.



¹ Martin ho had collaborated with BNMI when she was the international liaison at the Gabriel Garcia Marques Film School and later led a residency in Visual Arts.

Indigenous Knowledge

The 10 years of 1995-2005 saw a significant engagement with Indigenous culture and new media through the BNMI, working in close collaboration with the growing Aboriginal Arts Program at The Banff Centre. Within the larger affiliated Media and Visual Arts program Indigenous artists were a strong presence within the Visual Arts residencies, in Walter Phillips Gallery exhibitions, as part of television screen-writing initiatives, the Banff International Curatorial Residency and summits. BNMI provided training through the *Aboriginal Publishing Workshop*, as well as co-production, exhibition, and concept-sharing opportunities for Aboriginal people in Canada and beyond.



Diversity

The BNMI drew a line in the sand around its insistence in new media inclusion, making best efforts to seek racially diverse participants and to extend its dialogues and practices to the emerging and developing worlds. This was also the case with broader Media and Visual Arts residency programs. *The Bridges* initiative with the University of Southern California provided an opportunity to discuss not only interdisciplinary collaboration but equally intercultural collaboration. BNMI followed these events with the summit *Skinning our Tools: Designing for Context and Culture* (2003), an opportunity to delve into race, Indigenous experience and technology.



Gender

The BNMI paid careful attention, with varying success, to gender representation in all of its events, co-production efforts and research initiatives, including staffing. The BNMI encouraged representation of women within commercial production, it co-initiated and then hosted the annual *Women in the Director's Chair* program and worked with Canadian Women in Communications and Corus Entertainment to create the *Digital Media Career Accelerator*.

The Banff New Media Archive

Starting in 2004, in anticipation of ten years of discourse, co-production and research, extensive work was undertaken by guest archivists and work-study assistants to compile an archive of the BNMI's activities, collating documentation, audio recordings, and commissioned reports from each of the events chronologically, and then making these documents available to the public online. Funding was sought and received from the Canada Council for the Arts, Telefilm Canada and Canadian Heritage in order to create the archive, bring it online and publish a book. The Banff Centre Press and Riverside Press, University of Waterloo co-published *Euphoria and Dystopia: The Banff New Media Institute Dialogues*, <https://www.amazon.ca/Euphoria-Dystopia-Banff-Institute-Dialogues/dp/1894773225> with OCAD University and University of Sunderland, Newcastle collaborating to support an online version. It was a result of combing the archives to emerge themes in concepts and practice which characterized the BNMI over ten years. The transcripts are accompanied by a series of commissioned essays on the key topic areas, written on the occasion of the BNMI's 10th anniversary in 2005. Each chapter also includes a context-setting introduction written by the editors. The chapters will be rereleased this year to mark Canada 150.

Returning to the notes at the beginning of this paper it is useful to acknowledge these themes as a means of completing this segment, as many resonate today as well as pointing to the preoccupations of an era.

The Material Known as Data: The BNMI investigated the material known as data— that is changes in the nature of data, its organization, and its expression through memory, understandings of intelligence, actual material effects and objects that traverse the physical and virtual worlds.

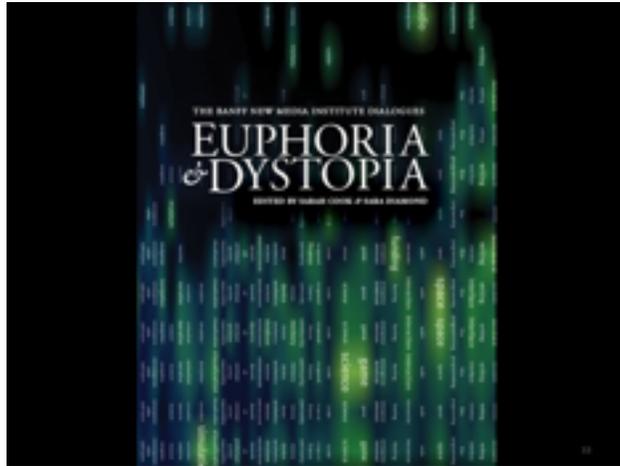
Physics, Perception and Immersion: The visual was of key significance as imaging technologies changed, linking the visual to the spatial and making possible the elision of virtual and physical architectures as well as emerging immersive technologies.

Becoming Machine/Staying Human: Definitions of how the human and *mechanique* are in constant transformation: from understanding the body and the changing nature of perception through the lens of technology; the emergence of artificial life, robotics, biotechnology, wearable technologies, mobile technologies, and nanotechnologies – where carbon and silicon intertwine.

Social and Individual Identity: Shifts in the expression of identity as expressed in new media such as: the rise of alternate cultures on the World Wide Web through the advent of streamed media; the potential of gaming to produce new structures of knowledge as well as play.

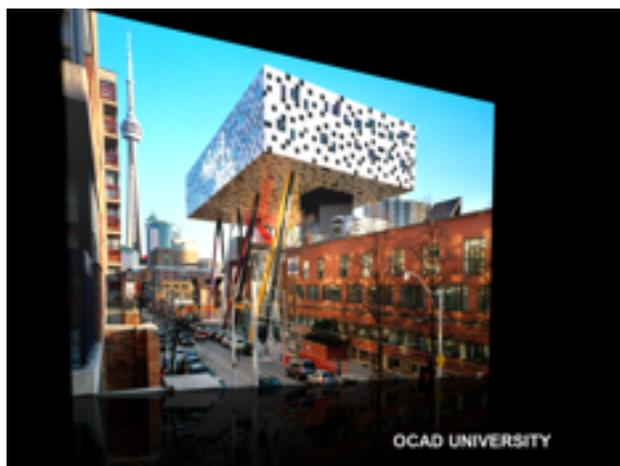
Money and Law: Experimentation with and sharing of emerging models of money (economic viability) and law (from licensing to appropriation), and played an active role in pulling together a creative new media industry with interests in both content and technology.

Production and Distribution: Research into and promotion of collaboration by looking at how the digital world shifted production and distribution, allowing the emerging of new models of collaborative practice.



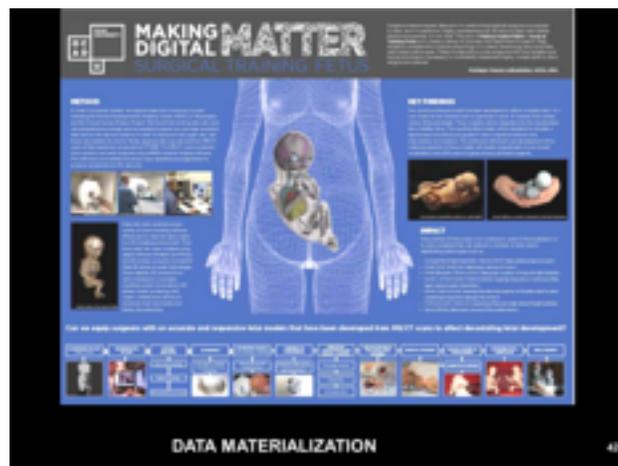
OCAD University: The Digital Media Research and Innovation Institute

The second reflection concerns efforts to establish new media research at OCAD University. OCAD U is 140 years old and is the largest and most comprehensive art and design school in Canada, with 4600 students that span undergraduate and graduate levels. It is a new university, entering the sector in 2002, but an old school. OCAD U's ethos is grounded in an historical focus in art, design, media, cultural and social theory. For over a decade it has been integrating digital and other emerging technologies into its pedagogical and research capacities. OCA – OCAD was home to electronic arts in the 1980s – artists' robotics, interactive media, computer music (Michael Snow, Norman White, David McIntosh, Judith Doyle, Simone Jones)... As OCAD U evolves to a university this ethos of research/creation is a strong part of the DNA – through artistic practice, in the labs, and curriculum.



In December the university adopted a new vision and mission statement which was framed by foresight work that identified trends in society, art and design practice and on OCAD University's history and current context. The vision states: "OCAD University challenges you to audaciously and responsibly pursue the questions of our time through the powerful interplay of art, design, the social sciences, humanities and the sciences." Themes within its mission include:

- Build generous, aware and joyful communities.
- Diversity, resilience, equity, inclusion, sustainability, respect for Indigenous voices and cultures.
- Transformative social, economic, environmental and cultural agents.
- Materials, data, technology and ideas enacted through research, studio practice, learning, embodied knowledge.



OCA+D+U = OCAD University

OCAD University has assertively entered research practice in the last eleven years. Humanities and social science research provides a backbone of traditional research, while research/creation, strategic foresight, critical design research and digital media/ICT research have emerged. Major investments and capacity-building has occurred in the digital realm, and now in practices connected to health and wellness. OCAD U has established internal capacity and gained recognition by Canadian Tri-council and Ontario funding agencies, Framework funding from the EU, international agreements, as well as increasingly attracting contract research. Characterized by using opportunities of funding to enable both experimentation and applied industry focused research.

OCAD University has prioritized building its research capacity through partnerships (local and international) as a means to accelerate development and impact, and as a means to include the integration of art, design and media methodologies into other disciplines. OCAD U's entry into

research has enhanced the student experience and has allowed the institution to more effectively transfer its knowledge to diverse communities. As research capacity has grown studio based faculty have become increasingly interested in joining research efforts and current academic and research planning places a priority on achieving clarity regarding research/creation and its support in the university.



In its 2012-2017 research plan it positions university research in the following way:

Art, design, and media research are intrinsically of significant value to the world, as well as in applied contexts and in partnership with other disciplines. Artists, designers, and media researchers have long undertaken practice-based research; their work increasingly receives recognition for fostering creativity, imagination, discovery, and ultimately, innovation. Art, design, and media research matter, because it adds a dimension of fulfillment and personal enrichment, but also because it changes the way we look at the world...Art, design, and media research form the foundation for the University of Imagination and play a seminal role in today's economy. Creative industries make increasingly significant contributions to innovation, well-being, productivity, and employment.

OCAD U's research provides a fruitful basis for partnerships with private and public sector partners, including government, industry, and commerce. Engaging in transformative research and innovation is therefore an integral part of OCAD University's vision while high quality, diverse research practices, undertaken with extensive outreach and partnerships, constitute a corner stone of the University of Imagination's mission statement. OCAD University is poised to lead in developing the practice, methodology, and understanding of practice-based research. In addition, the university continues to support more traditional forms of scholarship and research in the social sciences and humanities as well as in science and engineering. <http://www.ocadu.ca/research/strategic-research-plan.htm>



It lays out eight priority areas:

- Healthy and Inclusive Environments (Healthcare Design, Healthy Environment Design, Inclusive Design, Ambient Experience, Healthcare and Visual Art)



- Sustainable Futures (Urban Ecology, Bio-inspired Design, Sustainable Materials and Product Research)
- Material Innovation Aesthetics and Communication (Image-making, material inquiry, and haptic methodologies; Materials and methods in contemporary art practice; Multi-sensorial experience, synesthesia, and visual music; Corporeality, contemporary figuration, and the body in art and design; Advanced colour studies; Aesthetics, cognition and inquiries in perception; and Graphic design, information systems and data visualization)
- Digital Futures (Data Visualization; Mobile Media and Augmented Reality; Games Studies; Wearable Technologies; Emotion Studies; DIY Practices)

- Art and Design Education (Phenomenology of making; Teaching in virtual worlds and distant learning; Aesthetics and Ethics, Interactive Methods in Studio; Participatory and User-Centric Design)
- Aboriginal Visual Culture (Critical practices; Traditional and contemporary design innovation; Sustainable practices; Aboriginal cultural history in the Americas and beyond; gender identity; Visual Art and Design education)
- Critical Studies (Networks, Localities and Global Studies; Cultural Movements and Social Change; Bodies and Embodiments; History, Theory and Criticism of Art, Media and Design, Technologies and Digital Culture, socio-economic impacts).

Digital or new media research represents only a component, albeit significant within research practice and digital research occurs within many of the other categories. OCAD U is in the midst of updating its research plan to evaluate the extent to which research categories were appropriate to actual research undertaken and to update and plan future research priorities.

Digital Media Research and Innovation Institute

In 2008 (June 30th) OCAD University received a significant infusion of funding of \$9 million from the Ontario Ministry of Research and Innovation to support the creation of a major laboratory infrastructure, the acceleration of collaborative digital research and incubation activities at the university. The university matched this funding over a number of years with Canada Foundation for Innovation infrastructure funds through the Inclusive Design Institute, NSERC and industry funds and in-kind. The goals of the DMRII were as follows:

The DMRII enhances Ontario's competitive capabilities by bringing together design, computer science, art, media, engineering and social science. It fulfills a core mandate of Ontario's Innovation Agenda by supporting research excellence and by creating jobs for the creative and knowledge economies in the realm of information and communication technologies (ICT) and digital media. It also aligns with Canada's Science & Technology Strategy. By galvanizing research in the three core elements necessary to create world-class digital media capabilities in Ontario content, services and platforms the DMRII enhances Ontario's competitiveness in the fast-paced global digital marketplace. These high-quality research environments are equipped with the tools that allow OCAD University's research faculty, collaborating industry and community partners to undertake leading-edge research, innovation and commercialization.



OCAD University had played a major role in helping to frame Ontario's research and innovation agenda to expand to include both digital media and ICT, laying the foundation for the infusion of funds and an increased engagement with digital media sectors. The availability of these funds parallels a trend not only in Canada but internationally that recognized the value of interdisciplinary, collaborative research that brought together artists, designers, engineers, scientists as well as industry. There are many examples of university programs and labs that were founded in the late 1990s and first decade of the 21st century along this model. The breadth of capacity in OCAD U's labs, like Hexagram, has created significant research capacity and training in a number of areas. OCAD U has sustained its spirit of experimentalism that stems back to its OCA days in many of its labs that are led by artists. Other labs have adopted more of a traditional engineering/design approach with incremental not fundamental research.

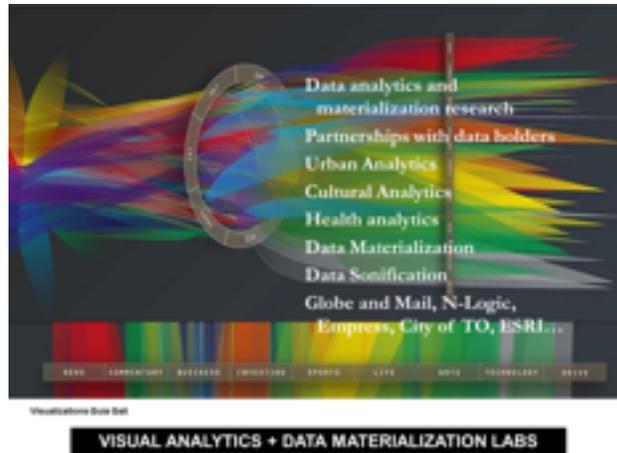
Unlike Hexagram in Montreal, the OCAD U infrastructure was distributed over four different sites and is comprised of approximately eighteen resources, allowing labs to intersect with physical locations of faculty and student engagement as well as the realities of OCAD U's constrained spaces. The diagram provides an overview of the labs when first conceived and the discussion that follows indicates some of the most productive laboratories that continue to this day:

- Strategic Innovation Lab: Envisions possible futures; intersections of human behaviour, new technologies and organizational capacities. Develops strategic foresight and visualization prototyping methodologies.
- Game Lab: Develops game theory as well as practice: AR and VR gaming, Indie Games, Serious Games, Gender and Games, Partners with gaming industry.
- Inclusive Design Research Centre and Inclusive Design Institute (CFI): Addresses how we design and develop information and communication technology systems so they are inclusive.
- Social Body Lab: The lab investigates the expressive and perceptive nature of the human form (body-based systems) in relation to wearable and mobile technologies and the Internet of Things.



- Visual Analytics Lab: Lack of criticality regarding nature of data sets and origins. Critical thinking on the nature of data, visualization, data representation (audio, haptic,

materialized), ethics, access, open data, empowerment, design, interaction, interface; focus on urban, transportation, environmental, health, financial, text, communications visualizations.

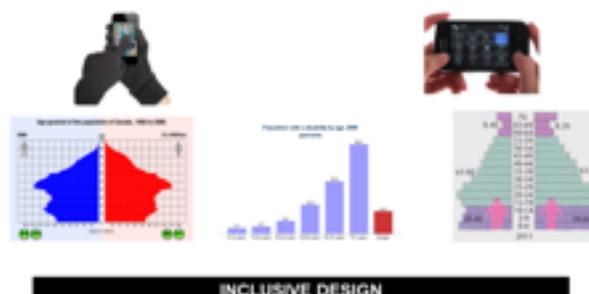


OCAD University has also created an Indigenous Visual Culture Lab, an Art Lab, Health Design Research lab and other research configurations that are outside of the DMRII.

Alignment of academic programs with laboratories

A fundamental difference between the Banff New Media Institute and OCAD University is the ability for OCAD U to align graduate and even undergraduate learning with laboratory research. For universities the goal of research needs to be the emergence of the next generation of research talent as much as support for faculty research. The following graduate programs have a direct alignment with labs: Strategic Foresight and Innovation Program; Digital Futures; Inclusive Design; Design for Health. OCAD U has a strong focus on providing undergraduate research opportunities. Undergraduate programs also act as feeders to labs and include Digital Futures undergraduate program, Integrated Media, Industrial Design, Graphic Design (data visualization), Material Art and Design, and Environmental Design.

A two-year program is open to students worldwide, with online courses which use highly interactive instructional design techniques, multi-disciplinary seminars co-taught by leaders in the field, and a major project.



For example, The Master of Digital Futures Program fuses together disruptive technologies and new thought leadership to form technology savvy leaders in digital applications, products, media content, practices and services. The Master of Strategic Foresight is a trans-disciplinary program that interweaves design, social science, technology, and business. Essential competencies are design thinking, strategic and iterative methodology, understanding human needs, wants and behaviors, systems thinking and data analytics and visualization. Some programs (SFI, Design for Health, Inclusive Design) permit students to apply laboratory research work to their course and thesis work, using the model of engineering and science programs. Others such as Digital Futures require a separation between lab work and course and thesis work, although internships and industry collaborations are required and count for credit.

DMRII outputs span classic science and engineering labs, such as prototypes, peer-reviewed conference presentations, publications (IEEE; InfoVis; Mobile HCI; CSCW; GRAND, ISEA, CHI, journals (Communications theory, education), and also include exhibitions, community workshops and commercialization.

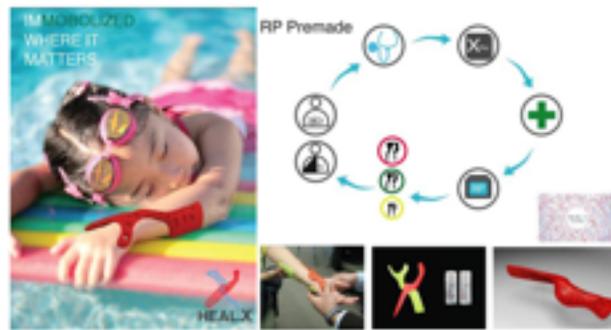


OCAD U projects have significant weight and impact. The Inclusive Design Research Centre <http://idrc.ocadu.ca/> leads policy development, the construction of a technology backbone that allows intensive interface personalization for individual users according to their abilities and many applications that support learning, culture and navigation. The Visual Analytics Laboratory was the co-principal investigator of the Center for Information Visualization and Data Driven Design, <http://www.civ-ddd.ca/>, a five year multi-million project that developed many visualization interfaces and strategies. Slab develops all manner of design processes for industry and government. <http://slab.ocadu.ca/>

DMRII researchers have initiated a number of summits to present their research such as *Mobile Nation* and the resulting book (2007) <https://www.amazon.ca/Mobile-Nation-Creating-Methodologies-Platforms/dp/097809784X>, and research discourse is part of the overall university context, for example *The State of Blackness* led by Dr. Andrea Fatona <http://www2.ocadu.ca/event/>

[the-state-of-blackness-from-production-to-presentation](#). However, the DMRII does not play the consistent public role that the BNMI did in raising strategic questions about the future of new media through a summit program. These questions are part of curriculum and individual research.

OCAD U established the **Imagination Catalyst** <http://www.ocadu.ca/research/imagination-catalyst.htm> as its hub for entrepreneurship and commercialization. It followed on five years of development and support of the Mobile Experience Innovation Centre, <http://www2.ocadu.ca/research/meic/home> and which brought together industry, university and college capacity to build mobile industry research and development, as well as policy. http://www.thinkconference.ca/wp-content/uploads/2014/04/Sara_Diamond.pdf. The Imagination Catalyst mission was to support and develop entrepreneurial talent amongst OCAD University faculty, student and alumni. Its focus is on design driven products, processes and service. The catalyst is supported through government funding, university infrastructure contributions, and the Relay Venture Fund \$1 million.



Canada

Support for Lab Infrastructures

DMRII labs are led by faculty researchers who are responsible for their funding renewal. Like many university infrastructures the health of labs depends on whether or not laboratory leaders and contributing faculty find the time and prioritize lab development. This is also impacted by lab income as OCAD U is still building a research management structure. There is support for technology and software acquisition, a Post-Doctoral Fellowship program, and some funding for lab management from research overhead. However, now that the initial DMRII funding is expended, further capacity for research within the labs depends on active researchers able to find funding through Canada Council, Tri-Council, Ontario, Framework (EU); sources for the support of art, design and digital media research are thin. Commercial, institutional and NFP partnerships and research supplement public sources. OCAD U is currently considering new models for laboratory management, such as shifting from individual to collective leadership of infrastructure. OCAD U plans to build lab infrastructure on Toronto's waterfront to amplify its collaborative research within that emerging "innovation" and digital media district. A Big Data Design Laboratory would support practices that engage the connected world, big data, machine learning, green technology, immersive media and critical thinking about the impacts of these technologies.

Conclusions

BNMI provided a model appropriate for its time – the creation of an independent new media research, creation and discourse centre that operated within a major arts organization, yet gained significant autonomy. While it impacted dialogue about creative practice and research and served up significant opportunities to network, its research productivity was limited to cycles of infrastructure development, project funding and focused leadership in program and lab support, and then disappeared. The Digital Media Research and Innovation Institute model offers more stability: a core of researchers and the engagement of a constantly refreshed resource of student talent. Research success requires significant refreshed technology and project funding and an administrative apparatus able to sustain it as well as the provision of time to undertake research on the part of faculty. As a university, OCAD U can build a consistent history of research development through the long-term nature of faculty research preoccupations and commitments. The optimism of the 1990s and early turn of this century have faded but artists and designers are engaged as ever before in not only offering critiques but proposing new directions with new technologies. OCAD U's commitment to ethical and diverse practices, Indigenous knowledge and culture and care for the impacts of research on environment and human life sustains the thread of critical optimism that sustained the BNMI for fifteen years.