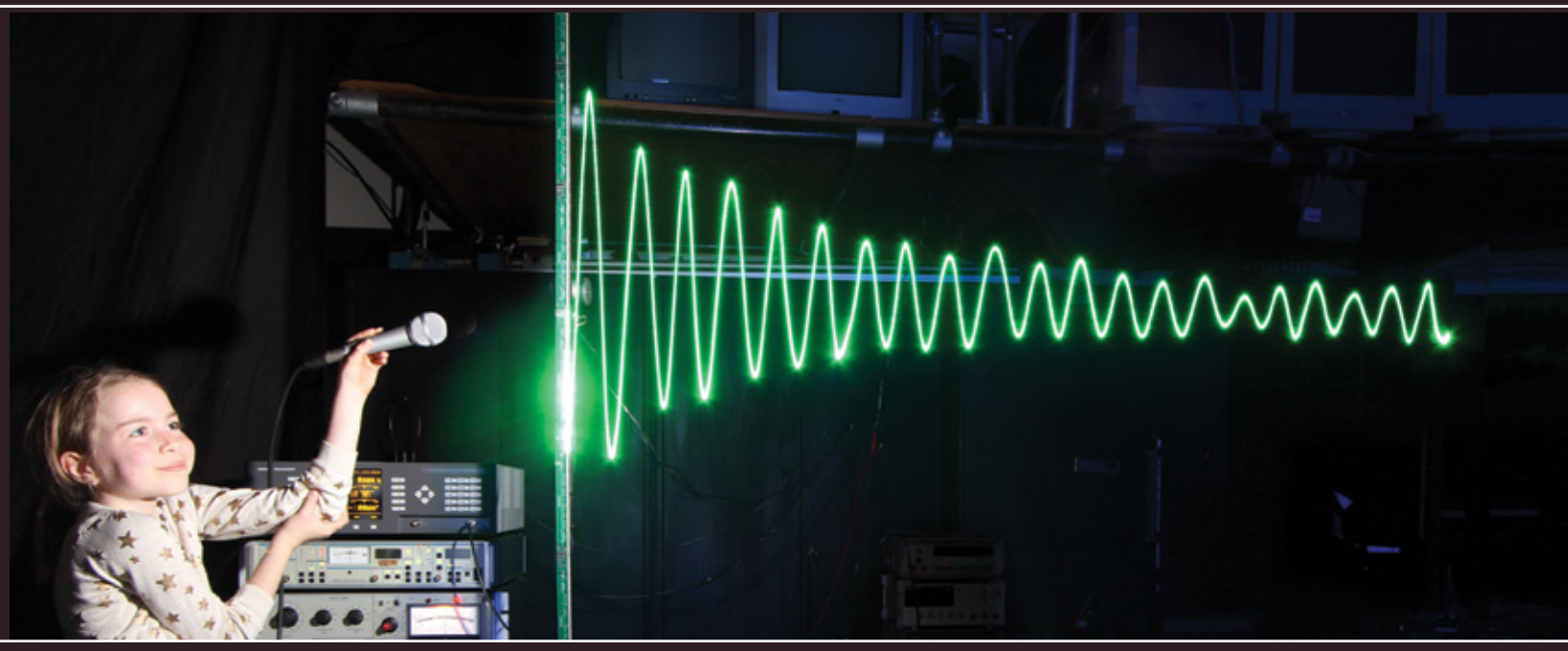
Virtual & Augmented Reality

VRTO 2016

WORLD CONFERENCE & EXPO

June 25-27th, 2016 • Toronto • Ontario • Canada



A unique, international exhibition and professional conference exploring arts, culture and science through immersive technologies

Director's Welcome Letter

We are lucky enough to have been alive when the internet was made publicly available, got a UI, overcame and exploded beyond skepticism, disrupting every facet of the modern human world. How exhilarating is it then, to have such an opportunity come around a second time, now in the form of immersive technology's Renaissance. This time we are armed with the benefit of hindsight.

I built this event - with the help of my colleagues - to disrupt, question, challenge, affect and yes, protect the future of this rapidly expanding force for change; to be inclusive, empowering, daring and noble. I welcome you, from the bottom of my human heart, to the inaugural VRTO Virtual & Augmented Reality World Conference & Expo.

Keram Malicki-Sanchez, Founder, Executive Director, VRTO

Code of Ethics on Human Augmentation: Ending the sensory divide; Feedback delayed is feedback denied.

- Jazz Code Concert, Sat. June 25th;
- Keynote Sun. June 26th 9:15am;
- Panel immediately following Keynote.

For 40+ years I've lived everyday life in a tetherless free-roaming virtual reality universe of my own making where I could see sound and radio waves, and more profoundly, others' sight. My most profound discovery was not what was inside that universe, but what was at its societal boundaries.

Immediately pressing, are the risks that humanistically intelligent entities, augmented by surveillance, pose right now. This sensory intelligence augmentation technology is already developed enough to be dangerous in the wrong hands, e.g. as a way for a corrupt entity to augment its power and use it unjustly [Minsky, Kurzweil, Mann 2013].

Accordingly, we on the panel invite all of you to be not just signatories to the "laws" of human augmentation, but to participate in the drafting and ratification of the written draft of these "laws" in Toronto on the morning of June 26th, 2016.

Steve Mann, Chief Scientist, Metavision.com

Cover photo: Stephanie, Age 9, can see sound waves with the Sequential Wave Imprinting Machine, invented by Steve Mann in 1974.

VRTO Virtual & Augmented Reality World Conference & Expo 2016 is brought to you by:

Virtual & Augmented Reality
VRTO 2016
WORLD CONFERENCE & EXPO
June 25-27, 2016 • Toronto • Ontario • Canada

VRTO Conference Team: Keram Malicki-Sanchez • Jessy Blaze • Joseph Ellsworth • Josh Miles Joudrie • Chrissy Aitchison • Meg White • Sarah Bradley • Corina Death • Adriel Malicki-Sanchez • Adam Fimio • Jason Spanu • Candace Steinberg • Celestial PR

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http://Conference.VirtualReality.TO

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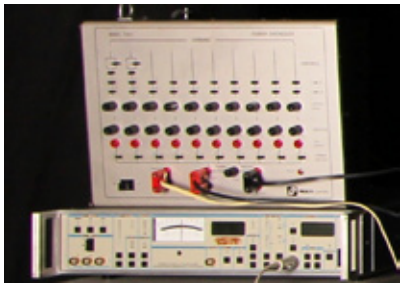
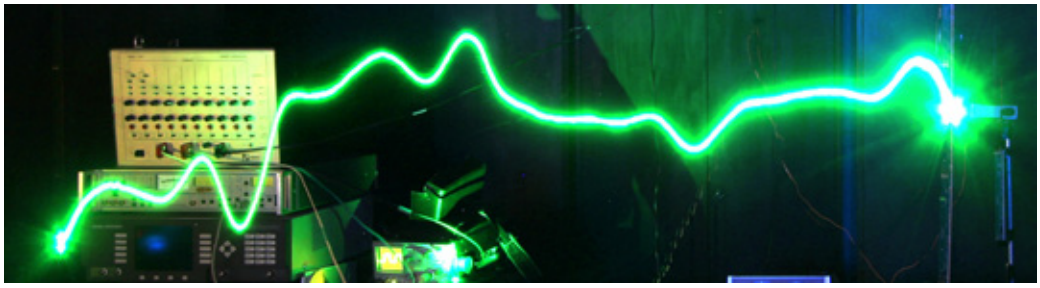
VRTO Conference is operated by VRTO (Virtual Reality, Toronto) a division of Constant Change Media Group Inc.

"T'd rather write a country's songs than its laws." [paraphrased from Andrew Fletcher, 1703]

"Codecert", A Concert for the Three Laws of Human Augmentation in real and virtual worlds

S. Mann, R. Janzen, and K. Yang, Saturday, Jun 25, 2016.

Tonight's concert is presented in 3 parts, and symbolizes the structural elements of the Code of Ethics on Human Augmentation (tweet #HACode). The Human Augmentation Code has been 14 years in the making and will be unveiled at Tomorrow's Keynote (9:15am), further developed during the panel (10am), and you are all invited to participate in its co-authorship in our "Town Hall" meeting immediately following the panel.

Musical Programme begins 8pm ♮ Saturday June 25th:

- Announcement and intro by S. Mann.
- Movement 0: (tweet #HACode0) is a free-form jazz jam played on hydraulophone (underwater pipe organ). S. Mann, R. Janzen, and K. Yang.
- Movement 1: (tweet #HACode1), "Liquid Nitrogen -- Infinite Square Well" (S. Mann, 1985), is about the Law of Sensory Auditability ("Metaveillance"). Sing (or play) along, by these rules:
    - Only the following four notes are allowed to be sounded during the movement: 1, 1#, 5, and 5#.
    - Initially, 1 and 1# are sounded together for the first measure.
    - Then 5 and 5# are added simultaneously, all 4 notes sounding for an additional 2 measures.
    - The 5# is released for 1 measure, then changed to 5 for the next measure, then back and forth between 5 and 5#, while keeping both 1 and 1# sounding.
    - Then 1, 1#, and 5 are sounded while back and forth between 8 and 8#.
    - The movement continues along similar patterns, with at least two adjacent notes always sounding.
    - It concludes on 1, 1#, 5, and 8, then 1# stops sounding, providing the only consonance.
- Movement 2: (tweet #HACode2) is a piece entitled "Adagio for (PASCO) Fourier Synthesizer and Lock-In Amplifier" (S. Mann 1978), and is about the Law of Sensory Reciprocity. This performance will be done by S. Mann, R. Janzen, and K. Yang.
- Movement 3: (tweet #HACode3) is a piece entitled "440" (S. Mann, 2008). It is about the Third Law of Human Augmentation. An much abridged version will be played tonight.

Each movement is more restrictive than the previous one, thus symbolizing the nested nature of the Three Laws, each Law following from the Law before it.

http://wearcam.org/codecert.htm

Panel: Ethics on Virtuality, Robotics, and Human Augmentation

Sunday, June 26th, 2016 • 10:00am – 11:00am • CR1D1 – Alumni Lounge

Moderator: Steve Mann | Chief Scientist – Meta

Steven Mann (born 1962) is a Canadian researcher and inventor best known for his work on computational photography, particularly wearable computing and high dynamic range imaging. Prof. Mann holds a PhD in Media Arts (1997) from the Massachusetts Institute of Technology and a B.Sc., B.Eng. and M.Eng. from McMaster University in 1987,1989 and 1992, respectively. He was also inducted into the McMaster University Alumni Hall of Fame, Alumni Gallery 2004, in recognition of his career as an inventor and teacher. While at MIT, in then Director Nicholas Negroponte's words "Steve Mann...brought the seed" that founded the Wearable Computing group in the Media Lab and "Steve Mann is the perfect example of someone...who persisted in his vision and ended up founding a new discipline." In 2004 he was named the recipient of the 2004 Leonardo Award for Excellence for his article "Existential Technology," published in Leonardo 36:1.

He is also General Chair of the IEEE International Symposium on Technology and Society, Associate Editor of IEEE Technology and Society, is a licensed Professional Engineer, and Senior Member of the IEEE.

Panelists:

Brett Leonard | Dir: Lawnmower Man

Mr. Leonard was recently named by The Producers Guild of America, in association with Variety Magazine, as one of its "Digital 25", recognizing the twenty-five leading visionaries, innovators and producers who have made significant contributions to the advancement of storytelling through digital media. The Guild's 4,500 members, including producers of film, television and new media, along with a distinguished Digital 25 Advisory Board, voted Mr. Leonard for this honor. Other recipients include directors James Cameron and Ridley Scott, and Facebook's founder, Mark Zuckerberg.

Robin Ingle | Chairman and CEO – Ingle Insurance

Robin Ingle is a Canadian entrepreneur and a specialist in special risk insurance, travel security and healthcare who currently serves as the chairman and CEO of the Ingle Group of Companies. Ingle has been in the insurance industry for over 38 years. He is frequently consulted by the media and the insurance industry as an authority on travel insurance, global security and health care issues.

Ken Nickerson | Co-Founder – Kobo

Mr. Ken Nickerson serves as the Chief Executive Officer at iBinary LLC. Mr. Nickerson is the Co-Founder of iBinary.com and serves as the Chief Executive Officer at iBinary Corporation. Mr. Nickerson served as an Advisor at The DocSpace Company. He served as the General Manager of MSN Canada. He served as the Chief Executive Officer at OpenCola, Ltd. Mr. Nickerson held the positions of General Manager at Microsoft Network Canada and was responsible for all e-commerce and consumer activities

in Canada from 1991 to 2000. While at Microsoft, he was instrumental in Microsoft's acquisition of Hotmail. Prior to joining Microsoft in 1991, Mr. Nickerson served in software engineering for several banking and insurance concerns and also served as Vice President, Technology Development of Rogers Communications. He served as the Chief Technology Officer at ClearPulse Inc. Mr. Nickerson was the Chief Technology Officer at The DocSpace Co. He sits on several private and public boards

Dan Braverman | Founder of St. Anthony Capital Partners

Daniel Braverman is an attorney and entrepreneur with an interest in the intersection between civil liberties and technology. As an undergraduate student at Princeton University, Daniel founded a campus chapter of the ACLU to combat the University's practice of surveilling students through dormitory key cards. Daniel's previous experience includes legal counsel and executive management positions in a variety of industries, including financial services, software, and banking. Daniel is currently the Founder and President of St. Anthony Capital Partners, a sector-specific private equity firm in Manhattan. Daniel received his Bachelor of Arts degree from Princeton University and his law degree from Harvard Law School.

Mir Adnan Ali | Founder CG Blockchain

Mir Adnan Ali is the Founder and CEO of CG Blockchain Inc. Adnan previously served as the CIO at InteraXon Inc. More recently, he served as Chief Scientist for Visionertech, where Adnan developed a novel microchip for signal processing and mediated-reality applications. He has been developing wearable systems for mediated reality and human augmentation for over 15 years, often in collaboration with Steve Mann. Adnan is co-inventor of six patents, and has written many scientific papers.

Graeme Moffat | PhD – VP of Scientific & Regulatory Affairs – Muse

Graeme leads neuroscience research and health and wellness applications for Muse. He has over a decade of research experience in psychology and neuroscience and in scientific management. Graeme served as managing editor of Frontiers in Neuroscience, the largest journal series in psychology and neuroscience, and of Frontiers in Neurology and Frontiers in Psychiatry. His experience has included research engineering at Neurelec/Oticon and graduate/postgraduate work at the National Scientific Research Centre (CNRS) in France. Graeme holds a PhD in neuroscience from Université Aix-Marseille. He is currently a TalentEdge Fellow of the the Ontario Centres of Excellence and a member of the Centre for Responsible Brainwave Technology (CeReB). In his spare time, Graeme throws frisbees and (occasionally) axes.

Ana Serrano | Chief Technology Officer, Canadian Film Centre

Ana Serrano, Chief Digital Officer, Canadian Film Centre (CFC) & Founder, CFC Media Lab. Educator, producer, entrepreneur and recipient of numerous digital media, film & theatre industry awards. Frequent speaker at international media & film festivals including TEDx about the creation & business of digital entertainment.

Code of Ethics on Human Augmentation

S. Mann, Brett Leonard, David Brin, Ana Serrano, Robin Ingle, Ken Nickerson, Caitlin Fisher, Samantha Mathews, R. Janzen, M. A. Ali, K. Yang, D. Braverman, S. Nerkar, K. M.-Sanchez, Zack P. Harris, Zach A. Harris, Jesse Damiani, Edward Button
http://www.eyetap.org/CyborgCode/

Abstract

The possibility that artificially intelligent machines may some day pose a risk is well-known [1].

Less understood, but more immediately pressing, are the risks that *humanistically intelligent* [5, 7] people or organizations pose, whether facilitated by "smart buildings", "smart cities" (a camera in every streetlight), or "cyborgs" with wearable or implantable intelligence. As we augment our bodies and our societies with ever more pervasive and possibly invasive sensing, computation, and communication, there comes a point when we ourselves become these technologies (what Minsky, Kurzweil, and Mann refer to as the "Sensory Singularity"[10]).

This sensory intelligence augmentation technology is already developed enough to be dangerous in the wrong hands, e.g. as a way for a corrupt government or corporation to further augment its power and use it unjustly.

Accordingly we have spent a number of years developing a Code of Ethics on Human Augmentation [9], further developed at IEEE ISTAS 2013 and IEEE GEM 2015 (the "Toronto Code"), resulting in three fundamental "laws".

1 Human Augmentation Code

These three "Laws" represent a philisophical ideal (like the laws of physics, or like Asimov's Laws of Robotics [2], not an enforcement (legal) paradigm:

- 1. (Metaveillance/Sensory-Auditability) Humans have a basic right to know when and how they're being surveilled, monitored, or sensed, whether in the real or virtual world.
- 2. (Equality/Fairness/Justice) Humans must (a) not be forbidden or discouraged from monitoring or sensing people, systems, or entities that are monitoring or sensing them, and (b) have the power to create their own "digital identities" and express themselves (e.g. to document their own lives, or to defend against false accusations), using data about them, whether in the real or virtual world. Humans have a right to defend themselves using information they have collected, and a responsibility not to falsify that information.
- 3a. (Aletheia/Unconcealedness/Technological-Auditability) With few exceptions, humans have an affirmative right to trace, verify, examine, and understand any information that has been recorded about them, and such information shall be provided immediately: **Feedback delayed is feedback denied**. In order to carry out the justice requirement of the Second Law, humans must have a right to access and use of information collected about them. Accordingly, we hold that Subjectrights [6] prevail over Copyright, e.g. the subject of a photograph or video recording enjoys some reasonable access to, and use of it. Similarly, machines that augment the human intellect must be held to the same ethical standard. We accept that old-fashioned, hierarchical institutions (e.g. law enforcement) still have need for occasional asymmetries of veillance, in order to apply accountability to harmful or dangerous forces, on our behalf. However such institutions must bear an ongoing and perpetual burden of proof that their functions and services justify secrecy of anything more than minimal duration or scope. Application of accountability upon such elites - even through renewably trusted surrogates, must be paramount, and a trend toward ever-increasing openness not thwarted.
- 3b. Humans must not design machines of malice. Moreover, all human augmentation technologies shall be developed and used in a spirit of truth, openness, and unconcealedness, providing comprehensibility through immediate feedback. (Again, feedback delayed is feedback denied.) Unconcealedness must also apply to a system's internal state, i.e. system designers shall design for immediate feedback, minimal latency, and take reasonable precautions to protect users from the negative effects (e.g. nausea and neural pathway overshoot formation) of delayed feedback.
- 3c. Systems of artificial intelligence and of human augmentation shall be produced as openly as possible and with diversity of implementation, so that mistakes and/or unsavory effects can be caught, not only by other humans but also by diversely competive and reciprocally critical AI (Artificial Intelligence) and HI (Humanistic Intelligence).

A metalaw states that the Code itself will be created in an open and transparent manner, i.e. with instant feedback and not written in secret. In this meta-ethics (ethics of ethics) spirit, continual rough drafts were posted (e.g. on social media such as Twitter #HA-Code), and members of the community were invited to give their input and even become co-authors.

2 The Second Law

The First Law is well-documented in existing literature on metasensing, metaveillance [8], and veillametrics [4]. Interestingly, the City of Hamilton, Ontario, Canada, has passed the following bylaw, relevant to the First Law of Human Augmentation:

> "No person shall: Apply, use, cause, permit or maintain ... the use of visual surveillance equipment where the exterior lenses are obstructed from view or which are employed so as to prevent observation of the direction in which they are aimed." [3].

The Second Law asserts that systems that watch us, while forbidding us from watching them, are unfair and often unjust.

2.1 The Veillance Divide is Justice Denied

In the new, "transhumanistic era", some machines will acquire human qualities such as AI (Artificial Intelligence), and some humans will acquire machine-like qualities such as near-perfect sensory and memory capabilities. Irrefutable recorded memories - suitable as evidence, not mere testimony - will challenge many of our old ways, calling for updated ethics that serve the interests of all parties, not just those with power or authority. Our greatest danger may be a "(sur)Veillance Divide" where things (Internet of Things) and elites may record with perfect memory, while ordinary people are forbidden from seeing or remembering. Therefore, we propose the following pledge, to clarify the need for fairness, equality, and two-way transparency:

- 2a(i). I pledge to not surveill or record any individual or group while simultaneously forbidding that individual or group from recording or sousveilling me.
- 2a(ii). I pledge to respect the needs of others for the sanctity of their personal space. I will negotiate any disagreements reasonably and with good will.
- 2a(iii). If I witness a crime against fellow humans, whether perpetrated by low-level criminals or by elites or by authorities, I will aim to record the event, overtly or covertly (whichever is appropriate). I will aim to make such recordings available to injured parties.
- 2a(iv). I will maintain that, with few exceptions, being surveilled while simultaneously being forbidden from sousveilling, is itself an injury. Therefore, if I witness any party being recorded, while that party is simultaneously prevented from recording, I will aim to record the incident, and to make the recording available to the injured party.
- 2a(v). I will make a best effort to be informed of escrow storage (e.g. "videscrow"), so that when recording others, there can be "temporary exclusions" on retroactive recording until disagreements may be adjudicated. Here the burden-of-proof is on the party prohibiting unescrowed recording.
- 2a(vi). I will try not to be provocative or confrontational, assuming the worst about others. But the light that I shine and the recordings I take may thwart injustice. It is possible to apologize and make amends for too much light. Too little can be lethal.

3 Conclusion

We take here an imporant first step toward the Human Augmentation Code 1.0. This is a "living document" and we are open to contributions from all, as it evolves.

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