Haptic Fields: Combining New Media Art, Sensory Anthropology, Music Technology and Engineering to Generate and Explore the Aesthetic Experience of Touch at a Distance

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Brief Project Description

Haptic Fields is an innovative research-creation program that brings together artistic work using new technologies, engineering, music technology and sensory anthropology to explore an overlooked but increasingly important sensory modality in todays audio-visual driven society - the sense of touch. The program of research is guided by three central questions:

1. Can touch be shared among a group of people distributed in a space?
2. How can cultural, historical and anthropological theories of touch inform technological and artistic development and practice in the burgeoning research area of haptics?
3. How can ethnographic methods from sensory anthropology be used to evaluate participant experience and thereby expand the range of standard engineering, Human Computer Interaction (HCI) and "human factors" approaches for measuring user experience?

These questions will be addressed through an unusual interdisciplinary team of investigators: research-creator Chris Salter; anthropologist David Howes; Marcelo Wanderley, director of CIRMMT McGill and an international expert in the design of new musical interfaces; and Concordia engineer Luis Rodriguez, a specialist in sensing and control systems for man-machine interfaces.

Artistically, the project will develop a multi-player/participant game-like performance entitled "Haptic Field." A group of public participants will gather in a large space and put on identical clothing/costumes that are outfitted with haptic devices (motors, low powered actuators, piezoelectric films) woven in or attached to the clothing and wireless sensors that can measure physiological response such as muscle reflex, and acceleration. In addition, each participant will be given a small hand held wireless interface that can generate force feedback, act as a steering mechanism and enable the identification of the player on the screen. The group is given visual feedback by way of a large projection surface in the environment that identifies the position of each participant in the space. The haptic devices can produce a range of touch-like sensations across the body, from barely perceivable to intense pressure. As the wireless sensing technologies enable all participants to share both sensing and actuation data, the touch-like sense impressions produced on each participant's body can thus move through the crowd, like the equivalent of a wave in a hockey game. At the same time, the participants' bodily response (jerking, shifting balance and similar physical acts) can modulate or change the intensity of touch on their own bodies. These sense impressions can thus be shared among visitors, creating the unique and uncanny sensation of a field of touch moving through and among a group of people.

The project combines three areas of focus: (1) historical/cultural research into the cultural formation and shaping of touch; (2) the artistic / technological development and outcomes informed by the anthropological work and (3) evaluative, qualitative techniques from the anthropology of the senses aimed at evaluating the direct bodily and sensory experience of the participants. The program of research cuts to the heart of research-creation by bringing together embodied practices of artistic production with research techniques and methodologies from the social sciences for both creation and evaluation, and cutting edge work in engineering, computer science and mathematics on the control of complex, asynchronous wireless signals, coordination of such signals in real time and the mapping of such signals onto multiple devices and media within an ever changing, dynamic environment.

Projected outcomes include: (1). The development of a Canadian/international presentation of Haptic Field in high profile exhibition contexts (TodaysArt, Elektra, ISEA2015, etc.); (2). Robust contribution to Canadian/international academic conferences in computer music, haptics and control engineering (NIME, ICMC, Eurohaptics); (3). Jointly authored publications in both technical and humanities/arts contexts (Leonardo, Senses and Society); (4). Development of devices and control software that can be utilized outside of the specific artistic domain (e.g., in rehabilitation context, interactive media and gaming); and (5) a range of questions and directions for future research.

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