

Neurodiversity: The Autism Project

Ali Hossaini, PhD

2011

Overview

Throughout the world societies are driven by clearly defined sets of cognitive norms. Yet sizable minorities of people process experience differently, notably individuals with autism. Also known as ASD, or autism spectrum disorder, these people communicate with difficulty, and they often exhibit psychological traits that alienate them from the mainstream.

Although defined as a behavioral disorder, many psychologists now consider sensory processing to be a major factor in ASD. The motivation of Neurodiversity is to model the perceptual worlds of autism and then to present them within an artwork that bridges the normal and the diverse.

Sights, sounds and other sensations will be projected in an immersive video dome that puts visitors within the mind of an autistic person. Autistic behavior can be confounding, and Neurodiversity seeks to interpret its source as a living reality.

The immediate goal of Neurodiversity is to generate a new understanding of autism. ASD creates sensitivities that are quite different than the norm, and autistic people have different standards for beauty, ugliness and other aesthetic qualities. Neurodiversity will help family, caregivers and the general public anticipate the needs of their autistic fellows, opening new avenues for communication.

The project will also generate research outputs, notably a set of holistic models of autistic consciousness. A dizzying array of neurological conditions are expressed as “autism,” and these models could be used to diagnose, classify and treat ensembles of ASD traits that have perceptual underpinnings.

Ultimately the project will invert itself, creating responsive digital environments that help autistic people interpret the neurotypical world. Building on earlier phases, it will develop assistive technologies that address neurological rather than behavioral issues. Vast reserves of talent, insight and energy lie trapped within ASD, and through Neurodiversity we can begin to explore these new frontiers of the mind.

Audience impact

Creativity thrives on difference, and, by presenting the diversity of inner life, the artist seeks to reveal something essential about human creativity. How do brains generate experience? Answering this question requires equal doses of art and science because there is no such thing as raw perception—our brains are spontaneously creative, which is why we each dwell in a unique subjective world.

For the artist, Neurodiversity offers new paradigms for expression, notably the opportunity to develop aesthetic experiences with scientific rigor. For audiences the installation should stimulate awareness of other ways of seeing. For autistic people, Neurodiversity could be a point of departure for dialog with neurotypical family, friends and caregivers.

We hope the installation will have a positive impact within the press and other public forums, leading to heightened sympathy for neurodiversity. Shown in conjunction with supporting content on site and on the web, the installation can provide a bracing yet educational experience that reveals the inner life of some of society's most marginalized members.

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Description

The installation will use several components to create an integrated sensory experience. The central element is an hemispheric video dome. Circular in shape, each room will function as an audiovisual representation of the human mind that incorporates tactile, olfactory and kinetic elements to facilitate complete immersion.

Input to the room will come from recordings that capture the movement and attention of an actual person. Video, audio and any other data captured during a sequence will be processed to recreate the awareness of neurodiverse individuals.

Each of these conditions manifests itself along a spectrum of intensity, and the installation can be calibrated to reflect a range of intensities. Words will be jumbled, faces blurred, phenomena amplified, colors shifted. The installation can be set to play a recorded "day in the life," or the helmet can be given to a participant who sends a live feed from locations outside the exhibition.

Development process

There are four primary research inputs into the project:

1. Interviews with high-functioning people diagnosed with ASD.
2. First person literary accounts of autistic perception.
3. Observation of special education classes, therapy and assisted living.
4. Clinical research literature on the neurological causes of ASD.

Please see appendices for lists of interviews, observation sessions, literature review and scientific bibliography.

Product & research outputs

Models of autistic perception

To underpin the creative process with intellectual rigour, the artist is modeling the sensory world of people with ASD. The models synthesise data from several sources to create a framework for relating the sensory phenomena associated with ASD to a consistent internal spectrum and also to other ways of considering a particular event/disorder, for instance, from a neurological or behavioural manifestation.

The Deviation Model places phenomena described by subjects onto spherical coordinates that integrate an event with its neurological basis and deviation from neurotypical (or normal) reactions. The sphere has three axes: sensitivity, channel integration and higher-order integration. Normative responses lie within a band in the middle of the sphere while many responses associated with autism lie outside those bands, creating a graphic representation of the autism spectrum. Phenomena placed within the sphere derive from descriptions provided by interviews, literature and observation. Clusters of data serve as a guide to creating an artistic simulation of that region on the spectrum.

The Association Model identifies possible relations among the phenomena of autism. The installation is a phenomenological expression of the conditions underlying ASD, and it relies on precise verbal descriptions which are translated into imagery and other experiences. Descriptions—the phenomena—are entered into a column which is then associated with

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other ways of describing the phenomenon: neurological, developmental, functional, psychological and behavioural.

Neurodiversity art installation

The core installation will consist of a hemispheric video dome that contains an immersive environment for the experience of autism. The dome will be multimodal, incorporating custom interfaces for inducing auditory, olfactory and tactile sensations, and it will also be responsive to motion, emotion and audience questions.

Visitors can absorb an experiential flow, or they can actively learn how the phenomena presented express neurological and psychological processes. Visitors will be encouraged to learn more by reviewing the conceptual models, literature and science used to develop the installation.

The installation will be configured for different media like the web, mobile devices and gaming platforms which, due to their immersive character, will present an ideal alternative to the physical installation.

Diagnostic tools

It may be possible to adapt elements of the installation and the underlying models for diagnosis. For instance, individuals diagnosed with ASD could calibrate the intensity of phenomena within the installation to their own perceptual comfort zones. This could be particularly useful if the individual is unable to articulate their condition. Customized versions could also be used by family members and caregivers to interact more effectively with neurodiverse individuals and also to adapt their general living conditions more accurately to “sensory friendly” standards.

Identifying clusters of related phenomena may articulate the often contradictory phenomena that characterize the autism spectrum. (For example, some individuals demonstrate hypersensitivity to auditory stimuli while others are hyposensitive.) Secondary diagnoses based on consistent ensembles of phenomena could be used to develop more effective methods of intervention.

Assistive technologies

Assisted typing has shown great promise many individuals, and new digital technologies like touch screen computing have inadvertently created a quantum leap in the communication skills of individuals with ASD. The installation itself could be calibrated by individuals with the appropriate interface, and understanding the sensory capabilities as an ensemble could serve as the basis for multimodal user interfaces that could be used both to stimulate development and facilitate communication based on an individual’s strengths.

General productivity tools

Finally there may be much to be gained from studying the coping strategies of autistic individuals. In many cases, they may have developed cognitive shortcuts and efficiencies that could be incorporated into general purpose software, training, education and communications applications.

Status of project

- **Research in medical literature** Artist has begun compiling notes, files and a reference library.

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- **Field research** The artist has begun observing special education classes in several cities, and he will continue to do so. Autistic individuals and their families have agreed to participate in formal and informal interviews, and methodologies for testing experiential segments will be developed.
- **Software development** Artist has identified potential development partners in case custom software development is required.
- **Advisory board** Highly qualified advisors from the fields of medicine, psychology and education have joined the project.
- **Education programme** Artist is working with advisors to develop lectures, workshops and media to accompany the exhibition.
- **Organisation** Artist is seeking a nonprofit fiscal sponsor to provide accounting and accountability.
- **Budget** Artist is developing a full budget with milestones against the production schedule below.
- **Funding** Artist has successfully raised \$5,000 seed funding through an online Kickstarter campaign. He is currently seeking commitments for funding, institutional partners and exhibition venues.

Installation narrative

Visitors will see one or more domes, each about five meters in diameter, within a larger gallery. Opposite the domes are interactive kiosks displaying information about the different neurological conditions portrayed within the domes. Aside from information the kiosks offer printouts and lecture schedules for an adjacent theater.

Each dome has an entrance large enough for people to enter single file, next to a label that discretely names the installation. The inner door turns out to be a projection surface, leading visitors to instinctively cluster in the center of the space, which contains moving images that stretch from floor to the apex of the hemisphere. Projected from a single ceiling-mounted projector, the images offer an unedited experiential flow, accompanied by sounds and smells, of places that are familiar to the visitor: the streets outside the gallery.

Visitors quickly realize they are witnessing a live feed. Effectively they are in someone's head. (Much like the characters in the film *Being John Malkovich*.) Weather, light and even the crowds resemble the world they just left, but after a few moments they realize there are significant differences between their experiences and the ones offered by the installation. They have entered the realm of neurodiversity, a place that questions their fundamental assumptions about reality.

In the center of each dome stands a slender pillar. The pillar is waist-high with an embedded trackball 20 cm across at the top. Each of the portrayed conditions involves a spectrum of atypical phenomena, and visitors control the intensity of the condition by rotating the ball. A centerpoint conveys neurotypical experience, so-called normality, and adjustments away from the center generate progressively more intense effects along axes corresponding to vision, sound, kinesthesia, smell, comfort and anxiety.

Elements of the experience will be drawn from first-person accounts of autism. Autism is a world where attention often functions without filters and voluntary will. Mainstream perception privileges the focal points of the eyes, and it de-emphasizes many sounds, movements, colors and patterns. Within the dome the hierarchies of neurotypical

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perception are abandoned. Background sounds are amplified—humming motors, jangling chains, distant jets—to excruciating volume. Walking under fluorescent bulbs precipitates a sudden change, as the room starts to strobe. People walk up, perhaps to ask directions, but they appear unpredictably in the field of vision, weaving in and out of view, and their faces are blank, giving no signals of intent. They loom in the buzzing, blooming confusion of light, sound and motion while their mouths emit a combination of sense and nonsense.

As the subject moves away from threatening faceless entities, something appears with great clarity: a pleasing hexagonal pattern created by tiles in the sidewalk. The details emerge in rivulets of sensation, building intensity until they drive away other distractions with their crystalline beauty. Following sidewalks to the street we see cars slowly pull up to a traffic light that moves in regular syncopated beats. Each car is tagged with numbers and letters, pleasing in their regularity, and we become absorbed in memorizing each set until someone disturbs us, shattering our concentration.

Artist bio

Ali Hossaini, Ph.D. is an artist, philosopher and producer who works at the cutting edge of media. Having collaborated with talent ranging from Robert Wilson to Brad Pitt, his personal work and his productions have been exhibited in museums, galleries and festivals internationally, winning acclaim from *The New York Times*, *Vanity Fair*, *Cool Hunting* and other outlets. He writes and lectures on a variety of academic, popular and business-related topics. As an advisor to Anthology Film Archives, The Foundation for Art and Creative Technology, the Vanuatu Pacifica Foundation, the Water Mill Foundation, White Box and other organizations, he is committed to applying culture to social development. His academic work lies in the philosophy of science, specializing in the development of photography from classical optics. (Please see attached for full biography.)

Advisory board bios

Thomas Armstrong, Ph.D. is an educator and psychologist, and the author of fourteen books including: *Neurodiversity: Discovering the Extraordinary Gifts of Autism, ADHD, Dyslexia, and Other Brain Differences*, *7 Kinds of Smart*, and *The Myth of the A.D.D. Child*. His books have been translated into twenty-five languages, including Spanish, Chinese, Hebrew, Danish, and Russian. He has written for *Ladies Home Journal*, *Family Circle*, and *Parenting* (where he was a regularly featured columnist for four years). He has appeared on several national and international television and radio programs, including NBC's *The Today Show*, CBS *This Morning*, CNN, the BBC and The Voice of America. Articles featuring his work have appeared in *The New York Times*, *The Washington Post*, *USA Today*, *Investor's Business Daily*, *Good Housekeeping*, and hundreds of other newspapers and magazines around the country. Dr. Armstrong has given over 800 keynotes, workshop presentations, and lectures in 43 states and 18 countries in the past twenty years. His clients have included Sesame Street, the Bureau of Indian Affairs, the European Council of International Schools, the Republic of Singapore, and several state departments of education.

Kóan Jeff Baysa, MD is a physician, contemporary art collector, curator, designer, writer, critic, Whitney Museum Independent Study Program - Helena Rubinstein Curatorial Fellow, and a member of AICA, the association of international art critics. He specialises in designing and producing projects and events that bring together seemingly disparate subjects. A contributing writer for the online publications Flavorpill, ArtSlant, Ctrl+P Journal of

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Contemporary Art, and columnist for the Scent Marketing Institute Newsletter, he has written for Art Asia Pacific, is the Pacific editor for d'Art International (Toronto), contributing writer and editor for the contemporary culture periodical, aRUde. As a medical scientist, his interests center around issues of the sensate body and in the ways that the physical self experiences and *knows* the world through the senses; as a cultural worker, his interests lie in examining the dynamics of subcultures nesting within larger cultures. As an artist, he is most interested in creating text-based works, experimenting in all media. KJ Baysa has curated shows for the London Biennale, LA International Biennial, Chinese Biennial, Whitney Museum, Canon Corporation, The United Nations, and has organized and participated in art events throughout the US and in Paris, Cork, London, Abu Dhabi, Dubai, Beijing, Bandung, Hong Kong, Manila, Santiago, Singapore, Cologne, Seoul, St. Petersburg, Madras, Mexico City, and Yokohama.

Additional advisors

Stephen Fairclough

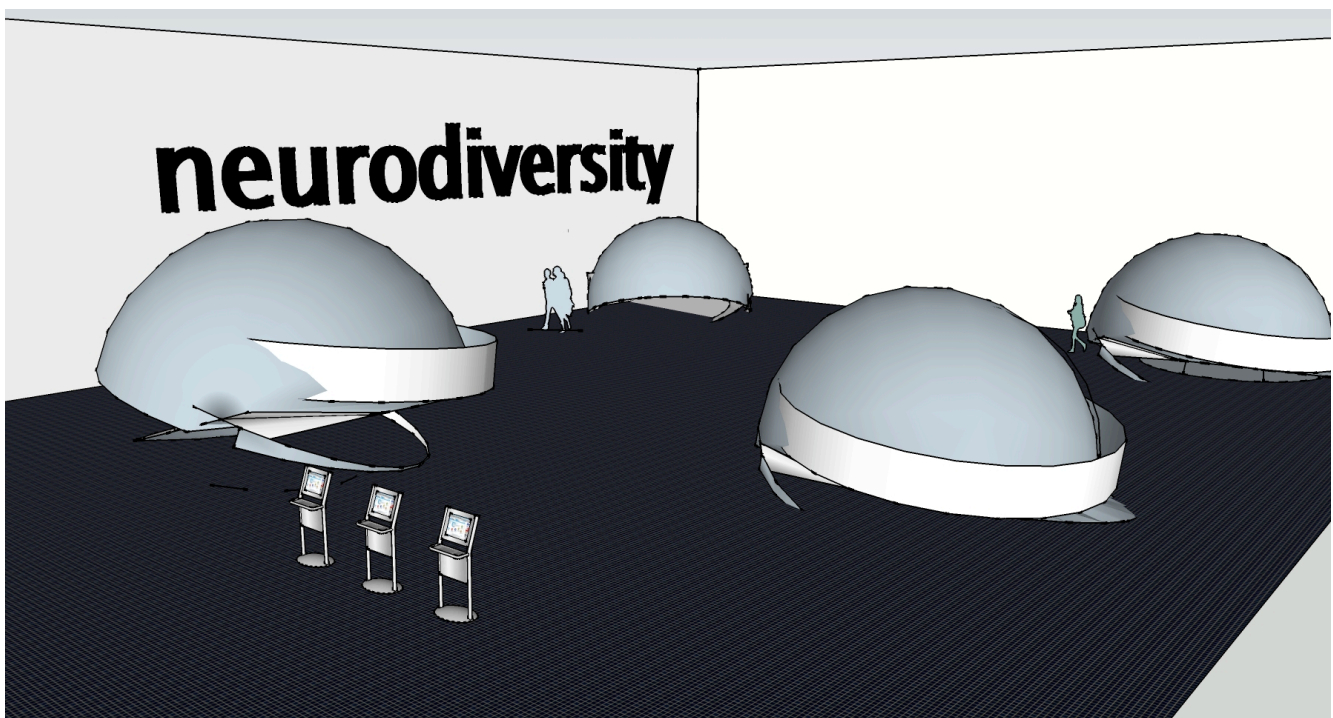
Kim Klingler

Francis McGlone

Amy Mednick

Mike Stubbs, CEO, FACT

Exhibition model



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Exhibition dome cutaway

