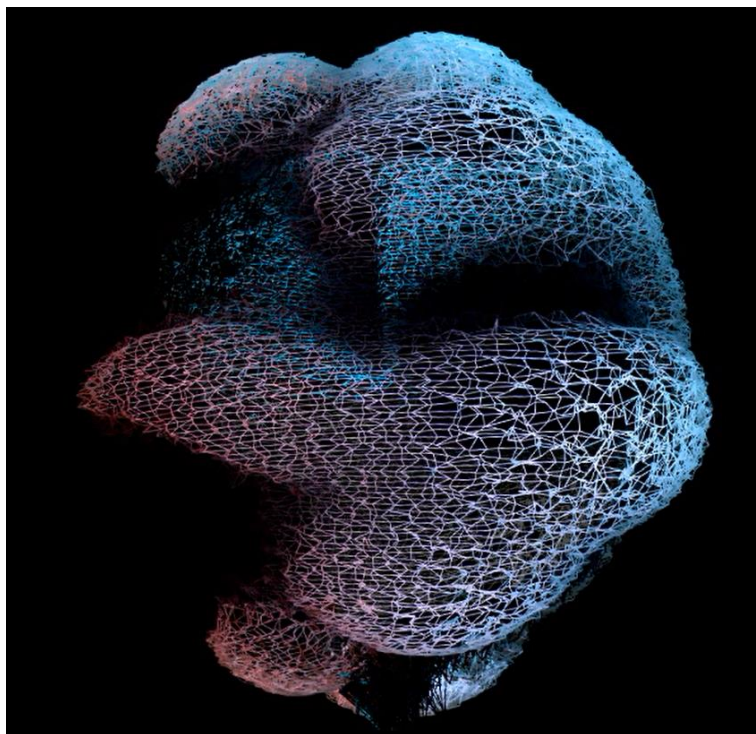# Title: Kinetic Visions

by [Nalini Singh]

Synopsis: Kinetic Visions is an interactive exhibit that uses Mediapipe's ability to record and analyze finely detailed human motion to convert user gestures into real-time visual responses that govern a dynamic 3D body or place. [Video link: https://vimeo.com/manage/videos/940743401]

Introduction: With the goal of examining the relationship between human movement and digital visualization, Kinetic Visions provides users with an immersive experience in which their movements affect and change the digital world around them. This project aims to establish a mutually beneficial interaction between virtual representation and actual movement by utilizing the capabilities of Mediapipe.

Concept and Background Research: Gestures can now serve as an interface for communication between humans and machines or between humans and computers thanks to advances in computer vision. A set of deliberate bodily movements meant to elicit a thought is called a dynamic gesture (McNeill, 1994; McNeill, 2011; Kita et al., 1997; Wachs et al., 2011). With a focus on computational innovation and interactive art installations, the initiative aims to develop the distinctions between the virtual and physical worlds. The design process is informed by research in interactive media, computer vision, and human-computer interaction, which makes it possible to create a responsive system that can capture the nuances of human motion.

Final Output of Interactive Visual generated

Technical Implementation: To put Kinetic Visions into practice, Mediapipe—a potent machine learning framework for real-time pose estimation and gesture recognition—must be included. In order to manage the behaviour of a 3D avatar or modify the visual representation of a digital environment, the system uses depth-sensing cameras or RGB cameras to record participant motions. These movements are subsequently analysed and converted into instructions.
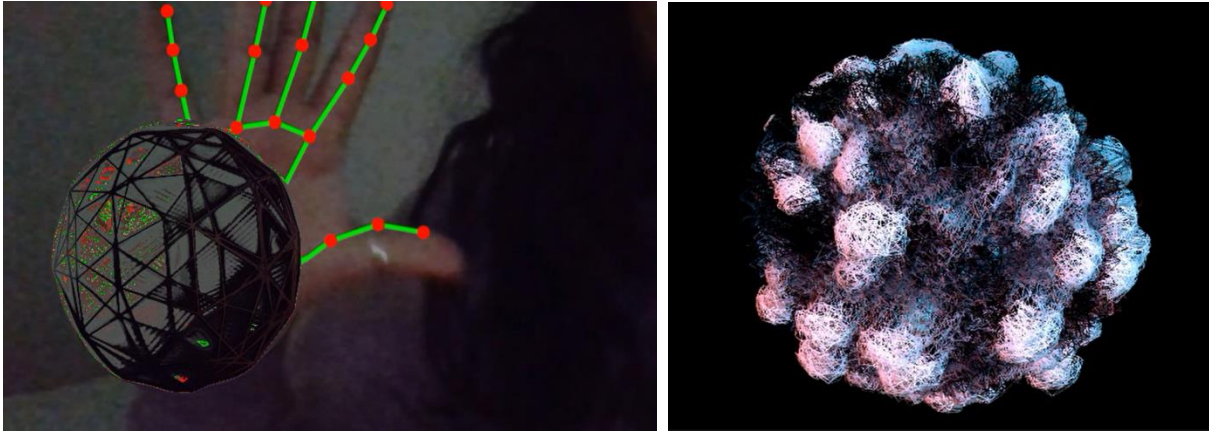
Kinetic Visions into practice : Using Mediapipe to control the movement

Video Link: https://vimeo.com/manage/videos/940743401

Thoughts and Prospects for Advancement: Over the course of creating Kinetic Visions, significant understandings of the difficulties associated with interactive visualisation and real-time motion tracking were obtained. Future development of the system's accuracy and responsiveness would be prioritised, along with the investigation of new gestures and interactions to improve the user experience. Further, for wider deployment and accessibility, factors like scalability and adaptability to various situations will be improtant.

Moreover, the initiative may be expanded to allow interaction with the real world outside of virtual settings. Kinetic Visions could create a cyborg experience for users by utilising gestures and body movements to give physical things dynamic interactions. By permitting users to modify and manipulate real-time physical objects, this foray into the realm of tactile interaction may pave the way for new forms of artistic expression and further erode the distinction between the digital and physical domains. It would also present new avenues for artistic experimentation and interaction design, all while augmenting the installation's immersive elements.

Citations:

D. McNeill (1994). Hand and Mind: What Movements Indicate About Mind. University of Chicago Press.

D. McNeill (2011). Gesture and Speech in Human Evolution: The Origin of Language. Cambridge University Press.

Kita, S., van der Hulst, H., & van Gijn, I. (Eds.). (1997). J.J. Gibson's Ecological Approach to Visual Perception and Its Legacy: Movement and Visual Attention. Psychology Press.

Gillam, M., Edan, Y., Wachs, J., and Stern, H. (2011). Vision-based Hand Gesture Recognition for Human-Computer Interaction. IEEE Transactions on Machine Intelligence and Pattern Analysis, 33(3), 191-207.

Documentation on Mediapipe: https://www.youtube.com/watch?v=swQUS2Dr2q8&t=85s

https://www.youtube.com/watch?v=NwqLnNyfOb4