5-Technological Breakthroughs That Lead to the Design-Development of a Conscious Robot that 'Sees,' 'Hears,' and Speaks Like a Human.

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Human-like AI: Since the advent of the field of AI, when Alan Turing [2] attempted to build a 'thinking machine'-computer, there has been confusion between machine-like AI and human-like AI. Because human-like AI involved 'thinking-conscious' processes that were clearly beyond the state-of-the-art, the whole field went in the direction of developing machine-like (objective) AI into android robots. The presentation will show that human-like (subjective) intelligence is a pre-requisite for the design of a 'conscious' machine.

A robotic controller that operates like the human brain. The brain controls the human body based on sensory data received by its 6-sensors. It also gives the human a volitional capability, often called a 'free will'-capability. This capability allows the human to change its control function within one frame period of receiving 'emergency' type data. The human brain does not compute, calculate, measure, or display data, as most modern day digital computers do. The human brain relates, co-relates, prioritizes, and remembers the data obtained from its sensory system. A RRC-robotic system that operates like the human brain will be described.

A robotic self identity coordinate frame-system: Humans have a self identity system that gives each human proprioceptive 'knowledge' of the location and identification of each part of its body and the approximate location of all points in the near space surrounding the body. In humans, the self-identity system is the central hub of intelligence for all the data gathered during its lifetime. A robotic 'self' identity system will be described.

A robotic visual system that forms a 3-dimensional photometric image within the self identity coordinate frame: The human visual system converts two 2-dimensional retinal images into a 3-dimensional image that is a high fidelity representation of the viewed objects. There is no computer vision system in existence today that forms a 3-dimensional image in the 'self' coordinate frame. Furthermore, in the field of visual neurobiology, it is not yet known how the visual cortex reconstructs the two 2-dimensional retinal images into a single 3-dimensional image that is a high fidelity representation of the objects that gave rise to that image. A robotic visual-technological and neurobiological breakthrough will be described.

A robotic auditory system that 'hears' and understands verbal speech, and responds intelligently by means a verbal sound generator: In a robotic auditory-talking system there are two problems that must be solved, a hearing problem and a talking problem. In hearing, the problem is of mapping the perceived acoustic spectrographic (a-f-t) properties of language into an identifiable phonetic structure. State of the art speech processing systems have not solved the acoustic mapping problem. A behavioral programming methodology was developed for 'unpacking' the highly encoded, context dependent speech signals. 'Unpacking' is performed in a robotic interface circuit by programming the robotic controller to repeat and remember the heard words and sentences of multiple speakers. In 'talking,' a phoneme based

verbal sound generator will be described, wherein all phoneme control signals emanate from the ‘self’-circuit within the controller.