# Exploring the Uncanny Valley: The Role of Frissonic Systems Within the Context of the Artificial
## *(or, Malfunctioning Sentience and Artificial Intelligence: How the Uncanny Informs Us of Who We Are)*

Garnet Hertz
02 December 2003

## Preface: Rokeby / Grenville / Mori

"I am very interested in looking at the relationship between the human mind and the computer-generated intelligence, perception, subjectivity or whatever, partly because there is a lot we can learn about ourselves by looking at how computers fail to do a good job being like us."
**David Rokeby**, interviewed by Erkki Huhtamo, *Alien Intelligence: The Movie* (2000), in reference to his project, The Giver of Names (http://homepage.mac.com/davidrokeby/gon.html)

"So this, perhaps, is the greatest threat of all, the threat that we cannot see a {cyborg} danger even as it stands before us because it is too familiar and, worse yet, we may be unnaturally attracted to it. Freud fixed on the uncanny because it allowed him to address two increasingly fundamental concepts: the notions of the death drive and the castration complex..."
**Bruce Grenville**, Curator/Author *The Uncanny: Experiments in Cyborg Culture*

**Masahiro Mori**, as described by Jasia Reichardt in *Robots: Fact, Fiction and Prediction*

## Thesis

The uncanny valley, as defined by Mori, is a region to be explored – not avoided – and this exploration in uncanniness creates a valuable frisson, acting as a point of attraction/repulsion that posesses the essence of being most-like-us while simultaneously being the most-unlike-us. In other words, avoiding the uncanny valley is a mistake because it is the point of greatest contrast to our own identities, while still maintaining the most similar "aliveness".

Furthermore, Mori's uncanny valley concept can be extended to consider the dimensions of cognition/intelligence and embodiment, creating a map for what is a valuable tool for gaining a unique perspective on both the historical narrative of "artificial life" and contemporary research in this area.

## Definition of Terms

**"The Uncanny Valley"**: Maharisho Mori

**"Frisson"** *(pronounced as in "free-sown"), noun*
1. An almost pleasurable sensation of fright: "A frisson of surprise shot through him." 2. A moment of intense excitement; a shudder: "The story's ending arouses a frisson of terror."
(etym: Old French, fricons "a trembling")
• used by **Burnham** (*Beyond Modern Sculpture*, p. 201) to describe the human attraction/repulsion while considering whether it is better to be a race of regulated automata.

**"Artificial Life"**
"the study of man-made systems that exhibit behaviors characteristic of natural systems. It compliments the traditional biological sciences concerned with the analysis of living organisms by attempting to synthesize life-like behaviors within computers and other artificial media... Whereas biology is largely concerned with the material basis of life, artificial life is concerned with the formal basis of life."
**Chris Jangton**, *Artificial Life*, Volume 1, (Redwood City, California, Addison-Wesley Publishing Company, 1987), p. 2.

## Multidimensional Uncannyness: A Proposal for Frissonic Systems

**Multidimensional Mori**
• Extended into embodiment and cognition/emergence

**The Cube of Humanity and Otherness**
• You are not me

**On the Disembodied Plane**
• Increasing Turingness: Stone, Calculator, PC, Cray, Glitchy A.I. System, Turing-passing Software

**On the Automata Plane**
• Increasing Embodiment: Stone, Doll, Vaucanson Automata

**On the Turing Plane**
• Increasing Embodiment: Turing-passing Software, Turing-passing "Cog", "Perfect" AI Android

**On the Android Plane**
• Increasing Turingness: Mannequins, C3PO, "Perfect" AI Android

**Looking Down: The Ebb and Flow of Uncanny Valleys**
• Patterns, "cuteness", approaching limits and inherent gaps

**Vertical Contrasts in Uncanniness: Frissionic Value**

**Conclusion**

## Relevant Quotes

### The Uncanny in Context

"...even though we think we have heard about, or watched the ultimate uncanny movie scene or computer game moment, every possible combination of living flesh hosted by lifeless flesh, dead flesh motile through living non-flesh, dead non-flesh quickened by flesh, etc., etc., and experience of the uncanny in our own day-to-day lives will always be possible.  Psychoanalytic theory claims that as long as we begin as babies in the arms of somebody, we will end up susceptible to uncanny experiences.   For now, the decor of the uncanny is technologically determined, but fashions in decor are not eternal."
**Jeanne Randolph**, "Looking Back at Cyborgs" p 221 in *The Uncanny: Experiments in Cyborg Culture*

"Automata since the sixteenth century have intruiged the public without frightening or intimidating them. The average person craves "safe" magic, the titillation and tiny ecstacy afforded by the occult kept securely in its cage."
**Jack Burnham**, *Beyond Modern Sculpture*, p. 187.

Vaucanson's Canard, which had a moving body, had flapping wings, and could quack, drink, eat and excrete, was an important shift because it "was an attempt to produce more than the outward features of an organism."
**Jack Burnham**, *Beyond Modern Sculpture*, p. 199.

"Records show that Vancanson was secretly occupied with a project sponsored by Louis XV: the duplication of a complete man with functioning internal organs, including blood circulation."
**Jack Burnham**, *Beyond Modern Sculpture*, p. 200.

### The Cube of Humanity and Otherness

"We really don't know if anyone else "understands", "thinks", or even is alive."
**Roger C. Schank**, *Understanding Searle*

"I have argued that the particular concrete nature of perceptual awareness, as occurrences in a certain perceptual system, is essential to the references they make to objects, events, or situations in the situational environment."
**Thomas Matioulas,** *The Primary Source of Intentionality*

"No one would suppose that we could produce milk and sugar by running a computer simulation of the

formal sequences in lactation and photosynthesis, but where the mind is concerned many people are willing to believe in such a miracle because of a deep and abiding dualism: the mind they suppose is a matter of formal processes and is independent of quite specific material causes in the way milk and sugar are not."
**John Searle**, *Minds, Brains and Programs*

## Vertical Contrasts in Uncanniness: Frissionic Value

"The interesting emergent events that involve artificial life simulations reside not in the simulations themselves, but in the ways that they change the way we think and interact with with world."
**Peter Cariani**, *Emergence and Artificial Life*, in Christoper Langton, Charles Taylor, J, Doyne Farmer, and Steen Sasmussen (eds.), Artificial Life II (Redwood City, CA: Addison-Wesly, 1992) p. 779.

"...one can simulate or synthesize living systems only if one has some idea what life is."
**Mark Bedau,** , *The Scientific and Philosophical Scope of Artificial Life*, p. 398, *Leonardo* 35:4

"Regardless of the ontological states one grants a-life, one is changed and changing as a result of one's encounters with and considerations of it."
**Edward A. Shanken**, *Life as We Know It and/or Life as It Could Be: Epistemology and the Ontology/Ontogeny of Artificial Life* p. 386.

"ALife is not just a scientific and engineering enterprise.  It offers a new perspective on the essential nature of many fundamental aspects of reality, such as life, adaptation, and creation."
**Mark Bedau**, *The Scientific and Philosophical Scope of Artificial Life*, Leonardo 35:4 (2002)

A. How does life arise from the non-living?
B. What are the potentials and limits of living systems?
C. How is life related to mind, machines and culture?
**Mark Beaau** (paraphrased) defining the goals of ALife in M.A. Bedau et al, "Open Problems in Artificial Life," *Artificial Life 6* (2000) pp. 363–376

"Better understandings of how to explain these {natural} phenomenon will also help resolve a cluster of puzzles about life, such as whether life admits of degrees, how the notion of life applies at different levels in the biological hierarchy and the relationship between the material embodiment of life and the dynamical processes in which those materials participate."
**Mark Bedau**, p. 398, *Leonardo* 35:4

Can emergence be defined as "a desire to have novel, unexpected, or unpredictable results spring from a controlled, designed system?"
**Mitchell Whitelaw**, *Leonardo* Vol 31 No 5

"...the cyborg is a shifting, ever evolving cipher of our own anxiety and desire to give meaning to the technological ethos."
**Bruce Grenville**, p 13, in *The Uncanny: Experiments in Cyborg Culture*

"In the genre of science fiction a recurring theme is the invisible line between humans and pseudo-human androids.  A secret delight is attached to guessing if a human actor acting as a mechanical man has not in some unknown way assumed the identity of his role.  We experience a *frisson* when some author convinces us that we would be better off as a face of regulated automata than remaining chaotic humans."
**Jack Burnham**, *Beyond Modern Sculpture*, p. 201.

"...there are some rare experiences, some trivial, some delightful, some revelatory, and some profoundly disturbing, when not a single interpretive template has any accuracy whatsoever... In this state, which I would term "cognitive lysis", in this aperceptual moment, the unreliability of ones' judgement is total. Cognitive lysis is an experience of being exiled from thought; not drowning in nonsense, but gliding in a stratosphere of un-sense."
**Jeanne Randolph**, "Looking Back at Cyborgs" p 183, in *The Uncanny: Experiments in Cyborg Culture*