

Tensor Network Theory and its Applications

SUMMARY

Pellionisz, A., 2000

The “Formal Theory of Cerebellar Function” abstract (see 1978) started development of “Tensor Network Theory” by Pellionisz’ biophysics and computer science domain expertise, based on a prior decade from the school of [John Szentagothai](#) (see abstracts and full PubMed publications since 1968-1970, joint papers with Szentagothai, 1971, 1973 a,b,c, 1974)

From 1976 a decade was devoted to work and publish mainly with Llinas. He filed in 1981 USPTO patent application “Llinas and Pellionisz” US 06/286,979, [issued as US 4450530 A on May 22, 1984, assigned to New York University.](#)

By 1986 Tensor Network Theory was experimentally tested and supported by independent researchers ([Gielen and Zuylen, 1986](#)), and provided the foundation for the new field of [Neurophilosophy](#) (by Churchland, 1986). Collaborations ensued with over 30 researchers worldwide, and applications were outlined in the [“Vistas” Cambridge University Press Book Chapter \(1988\)](#). Pellionisz authored TNT entering both [The Encyclopedia of Neuroscience](#), and [MIT Textbook](#).

From 1989, with the [“Fractal Model of Purkinje Neuron” Cambridge University Press Book Chapter](#), Pellionisz broke through the boundaries of non-euclidean metrical geometries to nonlinear dynamics (first signalled in the [1989 abstract](#)). Reversing both cardinal dogmas by recursive genome function, however, his breakthroughs were branded as “double lucid heresy”, with all the undesirable consequences both to advancement of science and technology, as well as to the pioneer. Pellionisz moved to apply “sensorimotor coordination to flight control”, since (and at that time top secret) existence proof was established that severely damaged (reconfigured) [F15 fighter jet could be landed on one wing \(now public, see YouTube\)](#). Pellionisz provided a wide-ranging blueprint for flight control, including automation([1990,-1995](#)). Quickly lured to [Germany in 1990 by their Alexander von Humboldt Prize for “Senior Distinguished American Scientists”](#), [it took NASA a full decade to successfully accomplish automated landing of massively reconfigured fighters.](#)

As an informatics-specialist who developed [computer models of neural nets of millions of brain cells](#), Pellionisz became rather familiar with the information that it takes, also for the genome, to develop them. Thus, he never believed the axioms of “Junk DNA” (that surprised human kind as 98.7% of our DNA upon Human Genome Project). Nor did he ever believe any “(Central) Dogma” that denied recursion, known since Cybernetics as “feedback” or to Nobelist Jacobs-Monod as “Operon”. Entering nonlinear dynamics (fractals and chaos) with brain cells at least since 1989, [Pellionisz could file FractoGene in 2002](#)