Prof. Ido Kanter - Short CV – 4/2024

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Scholar Source: https://scholar.google.com/citations?user=0MdAUb0AAAAJ&hl=en

Opening: Head of the Lab for Reverberating Modes in Neural Networks at the Gonda Brain Research Center, and specialize in models of disorder magnetic systems, ultrafast physical random number generators, theory of neural networks, neural cryptography, deep learning and synchronization among neurons and lasers, documented in more than 220 publications.

Research Highlights:

- Ultra-fast Physical Random Number Generators (206-2012)
- Openning the Field of Inverse Problem (1994-2006)
- Shannon Meets Carnot: Generalized Second Thermodynamic Law and Shannon Theory (2006-2010)
- Zero-lag Synchronization and the Greatest Common Divisor of Network Loops (2008-2010)
- Neural Cryptography (2000-2008)
- The New Neuron and the New Type of Dendritic Learning (2015-2020)
- Physics Assists with Key Challenges in Artificial Intelligence (2020-). The research shed light on the following fundamental theoretical questions regarding deep learning (DL):
    - Is shallow learning equivalent to DL? video
    - What is the best location of the pooling operators to enhance accuracy? video
    - Is brain learning, based on tree architectures only, weaker than AI?
    - Is there a universal law regarding how to efficiently build DL architectures?
    - Can error rates follow a universal law as a function of dataset sizes?
    - Finding the brain's mechanism for time series prediction without RNN video
    - What is the mechanism underlying DL? video
    - Advanced confidence methods in deep learning video

Educational Background:

1983 B.Sc., Summa Cum Laude, Bar-Ilan University Physics and Computer Science
1987 Ph.D., Bar-Ilan University, Physics

Academic Positions:

1996- Professor, Bar-Ilan University
1991-1996 Associate Professor, Bar-Ilan University
1989-1991 Senior Lecturer, Bar-Ilan University
1989 Visiting Research Fellow, Bell Laboratories with *Yann le Cun*
1988-1989 Visiting Research Fellow, Princeton University
with *P. W. Anderson (Nobel Laureate)*

Scholarships:

1982 Wolf Foundation Prize
1986 Landau Prize
1988-1989 Weizmann Postdoctoral Fellow (1988-1989)
2001 Humboldt Senior Research Prize (2001)

Editorial activity: Editorial board member of Scientific Reports, Frontiers in Neural Circuits.
Previously Editors in Physical Review E, Journal of Neural Systems, Journal of Stat. Physics.