[rPython+Python+qrng-rlib/QRNG/QRNG Devices/IMAGEAI] Interaction in the Context of Python based Ising Model Graphs - A Simple Suggestion & General Informatics Framework Towards Design+Implementation of IoT/HPC Heterogeneous Environment/s.

[Exploring Large Scale Ising Model Graphs Using (Python+R) Languages for Complex Image Processing & Informatics]

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[I] Inspiration & Introduction:

https://support.dwavesys.com > en-us > community > posts > 3600336228...

https://quantumcomputing.stackexchange.com > questions > how-do-you-..

https://www.researchgate.net > figure > Chimera-the-graph-of-qubit-interacti..

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ieeexplore.ieee.org > document

https://rajeshrinet.github.io > blog > ising-model

isingmodelproject.blogspot.com

physics.princeton.edu > ~phy209 > week5 > ising.py.html https://blog.rstudio.com > 2018/09/12 > getting-started-with-deep-learning...

http://oops.uni-oldenburg.de/353/1/383.pdf - Statistical Mechanical Models for Image Processing

Statistical Image Restoration via the Ising Model - Quick2Degrees.com

www.quick2degrees.com > ddata - by M C Kandes.

 $\underline{Optimal\ structure\ and\ parameter\ learning\ of\ Ising\ models\ |\ Science\ \dots\ -\ https://advances.sciencemag.org\ >\ content$

by AY Lokhov - 2018.

<u>Inference in Ising Models – arXiv</u> - <u>https://arxiv.org > pdf</u>

by B B Bhattacharya - 2015.

[II] R&D Informatics Framework Using Python+R in the Context of Ising Model Graphs:

ISING MODEL GRAPHS USING R+PYTHON+rPYTHON+QRNG SERVICES TOWARDS IOT+HPC HETEROGENEOUS ENVIRONMENT/S

IN THE CONTEXT OF AI/ML/DL BASED COMPLEX SYSTEMS

rPython+Python interaction+qrng-rlib/QRNG Services interfacing to perform research in the context of quantum computing for next generation - Bioinformatics/Telecom/Space etc..

python input/s for Ising Models for advanced information processing

Ising Model Graphs -Python

This could be easily implemented using IoT/HPC Hardware/Software Frameworks Here we are not describing Hardware/Software/Firmware details Please Check other publications on Vixra.org.

Thanks - Dr.Nirmal

rpython+Python+R language based Machine Learning Tools for Data Mining.
QRNG/qrng-rlib software/lib tools could be integrated with the above mentioned framework/
to probe advanced AI/ML/DL algorithms towards Complex Information Processing Applications.

Approximate Informatics Framework - Using Python+R+rPython in the Context of compex Information Processing With IoT/HPC Systems towards Space/Medicine/Telecom/AI/ML/DL R&D Domains & Applications.

Short Technical Note - Please Check & Satisfy Yourselves.

Not all details are shown.

Thanks - Dr.Nirmal

Tresting in Progress - With some promising results. Actual Implementation Will Vary Please Note.

[Figure I – Approximate Informatics Using Python+R in the Context of Python based Ising Model Graphs]

ISING MODEL GRAPHS USING R+PYTHON+rPYTHON+QRNG SERVICES TOWARDS IOT+HPC HETEROGENEOUS ENVIRONMENT/S IN THE CONTEXT OF AI/ML/DL BASED COMPLEX SYSTEMS R+Python+IMAGEAI - Advanced Image Processing Applications R&D rPython+Python interaction+qrng-rlib/QRNG Services interfacing to perform research in the context of quantum computing for next generation - Bioinformatics/Telecom/Space etc.. python input/s for Ising Models output/s using the above mentioned concepts for advanced information Ising Model Graphs+IMAGEAI in Python This could be easily implemented using IoT/HPC Hardware/Software Frameworks Here we are not describing Hardware/Software/Firmware details Please Check other publications on Vixra.org rpython+Python+R language based Machine Learning Tools for Data Mining. QRNG/qrng-rlib software/lib tools could be integrated with the above mentioned framework/ to probe advanced AI/ML/DL algorithms towards Complex Information Processing Applications Approximate Informatics Framework - Using Python+R+rPython in the Context of compex Information Processing With IoT/HPC Systems towards Space/Medicine/Telecom/AI/ML/DL R&D Domains & Applications. Short Technical Note - Please Check & Satisfy Yourselves. Not all details are shown. Thanks - Dr.Nirmal Testing in Progress - With some promising results. Actual Implementation Will Vary

[Figure II - Approximate Informatics Using Python+R in the Context of Python based Ising Model Graphs /IMAGEAI]

"The Ising model named after the physicist Ernst Ising, is a mathematical model of ferromagnetism in statistical mechanics. The model consists of discrete variables that represent magnetic dipole moments of atomic spins that can be in one of two states (+1 or -1). The spins are arranged in a graph, usually a lattice, allowing each spin to interact with its neighbors. The model allows the identification of phase transitions, as a simplified model of reality. The two-dimensional square-lattice Ising model is one of the simplest statistical models to show a phase transition.

The Ising model was invented by the physicist <u>Wilhelm Lenz(1920)</u>, who gave it as a problem to his student Ernst Ising. The one-dimensional Ising model has no phase transition and was solved by <u>Ising (1925)</u> himself in his 1924 thesis. The two-dimensional square lattice Ising model is much harder, and was given an analytic description much later, by <u>Lars Onsager(1944)</u>. It is usually solved by a <u>transfer-matrix method</u>, although there exist different approaches, more related to <u>quantum field theory</u>. In dimensions greater than four, the phase transition of the Ising model is described by <u>mean field theory</u>. "

[Source : https://en.wikipedia.org/wiki/Ising_model]

Please Note.

[III] Related R&D Information on Mathematics & Software Used:

https://en.wikipedia.org > wiki > Ising_model www.math.ubc.ca > ~andrewr > research > intro_html > node14 https://iuuk.mff.cuni.cz > ~andrew > Potts

https://arxiv.org > pdf www2.math.uu.se > ~svante > papers

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https://advances.sciencemag.org > content https://link.aps.org > doi > PhysRevE.96.012132 https://www.ncbi.nlm.nih.gov > pmc > articles > PMC5556059

drops.dagstuhl.de > volltexte > pdf > LIPIcs-APPROX-RANDOM-2017-23 https://github.com > gavento > graph-ising https://mattbierbaum.github.io > ising

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https://www.lanl.gov > projects > dwave > assets > Rogers _00-DWave _Ising https://support.dwavesys.com > en-us > community > posts > 3600336228...

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https://rpython.readthedocs.io > latest > getting-started

https://pypi.org > project > rpython https://towardsdatascience.com > from-r-vs-python-to-r-and-python-aa25d... https://www.python.org

https://www.r-project.org > about https://cran.r-project.org > web > packages > qrng > qrng https://qithub.com > edzer > qrnq

https://qrng.physik.hu-berlin.de > download https://rdrr.io > CRAN > qrng https://cognitiveclass.ai > courses > machine-learning-r

https://www.analyticsvidhya.com > blog > 2016/02 > complete-tutorial-lear. https://www.kaggle.com > camnugent > introduction-to-machine-learning-i. https://lgatto.github.io > IntroMachineLearningWithR > an-introduction-to...

[IV] Acknowledgment/s:

Special Thanks to all. Non-Profit R&D Only.

[THE END]