A Simple Understanding of Computational Complexity Theory & Spin Glass Theory & Ising Models Classification Based on Mathematical Concepts Using AI/ ML/DL/Python Software.

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[A] Introduction & Inspiration :

http://assets.press.princeton.edu/chapters/i9917.pdf

https://www.imsc.res.in/~menon/disorder_chapter.pdf

https://tel.archives-ouvertes.fr/tel-00683603/document

https://arxiv.org/abs/cond-mat/0505032

https://en.wikipedia.org/wiki/Spin_glass

Inspiration :

[http://www.nobel-winners.com/Physics/philip_warren_anderson.html]

https://en.wikipedia.org/wiki/Philip_Warren_Anderson
https://physicstoday.scitation.org/doi/10.1063/1.2811268?journalCode=pto
https://physicstoday.scitation.org/doi/10.1063/1.2811336?journalCode=pto
https://physicstoday.scitation.org/doi/10.1063/1.2811440?journalCode=pto
https://physicstoday.scitation.org/doi/10.1063/1.881135?journalCode=pto
https://physicstoday.scitation.org/doi/10.1063/1.2811073?journalCode=pto
https://physicstoday.scitation.org/doi/10.1063/1.2811137?journalCode=pto
https://physicstoday.scitation.org/doi/10.1063/1.2810479?journalCode=pto

http://vixra.org/author/nirmal_tej_kumar
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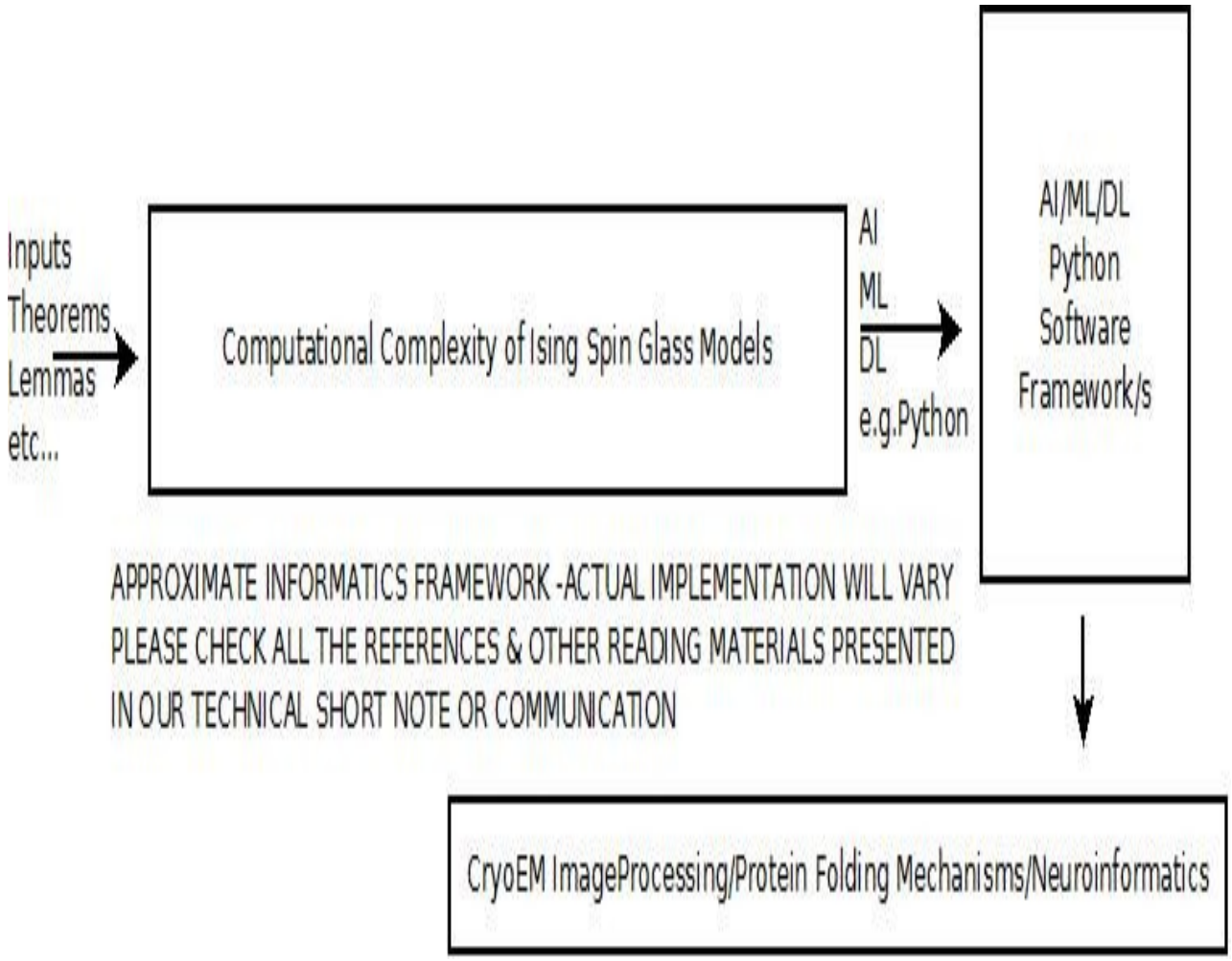
http://vixra.org/author/n_t_kumar
http://vixra.org/author/d_n_t_kumar

[B] Informatics Framework & Implementation :



One of the BEST Publications I have seen so far :

" On the computational complexity of 'Ising Spin Glass Models' by Francisco Barahona Departamento de Matematicas, Universidad de Chile, Casilla 5272, Correo 3, Santiago, Chile Received 17 September 1981, in final form 13 April 1982 ".

[C] Useful Information on Mathematics & Software Used :

[i] http://vixra.org/abs/1901.0027

[ii] http://vixra.org/abs/1812.0454

[iii] http://www.math.zju.edu.cn:8080/wjd/notespapers/Barahona.pdf

[iv] https://towardsdatascience.com/simple-machine-learning-model-in-python-in-5-lines-of-code-fe03d72e78c6

[v] https://www.dataquest.io/blog/machine-learning-python/

[vi] https://www.dataquest.io/blog/deep-learning-neural-networks-python/

[vii] https://www.kdnuggets.com/2018/11/top-python-deep-learning-libraries.html

[viii] https://www.dataquest.io/blog/top-20-python-ai-and-machine-learning-open-source-projects/

[ix] https://www.quora.com/After-learning-Python-how-do-I-learn-machine-learning-AI

[x] https://towardsdatascience.com/object-detection-with-10-lines-of-code-d6cb4d86f606 - IMAGEAI

[xi] **Ising Models Using Python :**

https://rajeshrinet.github.io/blog/2014/ising-model/

https://github.com/bdhammel/Ising-Model

https://github.com/prtkm/ising-monte-carlo/blob/master/ising-monte-carlo.org

http://vixra.org/pdf/1710.0021v1.pdf

http://www.physics.rutgers.edu/~haule/681/src_MC/python_codes/ising.py

http://csc.ucdavis.edu/~chaos/courses/nlp/Projects2007/JimMa/2DIsingReport.pdf

http://pages.physics.cornell.edu/~myers/teaching/ComputationalMethods/ComputerExercises/Ising/Ising.html

https://physics.weber.edu/thermal/isingVPython.html

[D] Acknowledgment :

Thanks to all who made this happen in my LIFE.Non-profit Academic R&D.

Important References :

●Anderson, Philip W. (1 March 1958). "Absence of diffusion in certain random lattices". *Physical Review*. **109** (5): 1492–1505. Bibcode:1958PhRv..109.1492A. doi:10.1103/PhysRev.109.1492. Pdf.

●Anderson, Philip W. (1 April 1963). "Plasmons, gauge invariance, and mass". *Physical Review*. **130** (1): 439–442. Bibcode:1963PhRv..130..439A. doi:10.1103/PhysRev.130.439. Pdf.

●Anderson, Philip W.; Halperin, Bertrand I.; Varma, Chandra M. (January 1972). "Anomalous low-temperature thermal properties of glasses and spin glasses". *Philosophical Magazine*. **25** (1): 1–9. Bibcode:1972PMag...25....1A. doi:10.1080/14786437208229210. Pdf.

●Anderson, Philip W. (4 August 1972). "More is different". *Science*. **177** (4047): 393–396. Bibcode:1972Sci...177..393A. doi:10.1126/science.177.4047.393. JSTOR 1734697. PMID 17796623. Pdf.

●Anderson, Philip W. (8 July 1999). "Computing: solving problems in finite time". *Nature*. **400** (6740): 115. Bibcode:1999Natur.400..115A. Doi:10.1038/22001.

●Anderson, Philip W. (February 2000). "Brainwashed by Feynman?". *Physics Today*. **53** (2): 11–14. Bibcode:2000PhT....53b..11A. doi:10.1063/1.882955. Pdf.

●Anderson, Philip W. (27 September 2005). "Thinking big". *Nature*. **437** (7059): 625–626. Bibcode:2005Natur.437..625A. doi:10.1038/437625a.

●Anderson, Philip W. (1 September 2007). "Twenty years of talking past each other: the theory of high T_C". *Physica C*. 460–462 (Part 1): 3–. Bibcode:2007PhyC..460....3A. doi:10.1016/j.physc.2007.03.261.

KEEP GOING - NEVER GIVE UP -FOR IT IS INTERESTING & PROMISING

SPIN GLASS THEORY HOLDS LOT OF HIDDEN TECHNOLOGIES

THANKS FOR READING MY TECHNICAL SHORT NOTES

THE END.