# Applications of Random Matrices to Image Processing for Image Denoising in the Context of Cryo-Electron Microscopy[Cryo-EM] Image Processing & Informatics Using [ Julia Language + Fortran based SIMPLE Cryo-EM Software ] towards PETASCALE-HPC Algorithm/s Design,Understanding & Testing – A Simple Suggestion With an Interesting [ R&D ] Insight.

[ SIMPLE Cryo-EM Software +Julia Random Matrices Library interfacing for Testing IoT/HPC/Heterogeneous Computing R&D ]
[ Julia joins Fortran/C/C++ Club as a high-level language in which PETAFLOPS computations have been achieved ]

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**[I] Inspiration & Introduction :**

**“Random matrices were first introduced in studies related to mathematical statistics by Wishart, Hsu. Later, Dyson recognized that would be required a new type of statistical mechanics to describe the nuclear energy levels and Wigner in his seminal work modeling the spectra of heavy atoms found that random matrices were the answer to this problem. The goal here is to use random matrix theory for applications to image processing in the context of cryo-EM Image Processing domain”.**

[ Source - https://repository.lib.fit.edu/handle/11141/736 ]

**“Julia uses multiple dispatch as a paradigm, making it easy to express many object-oriented and functional programming patterns. Julia is a high-level general-purpose dynamic programming language designed for high-performance numerical analysis and computational science”.**

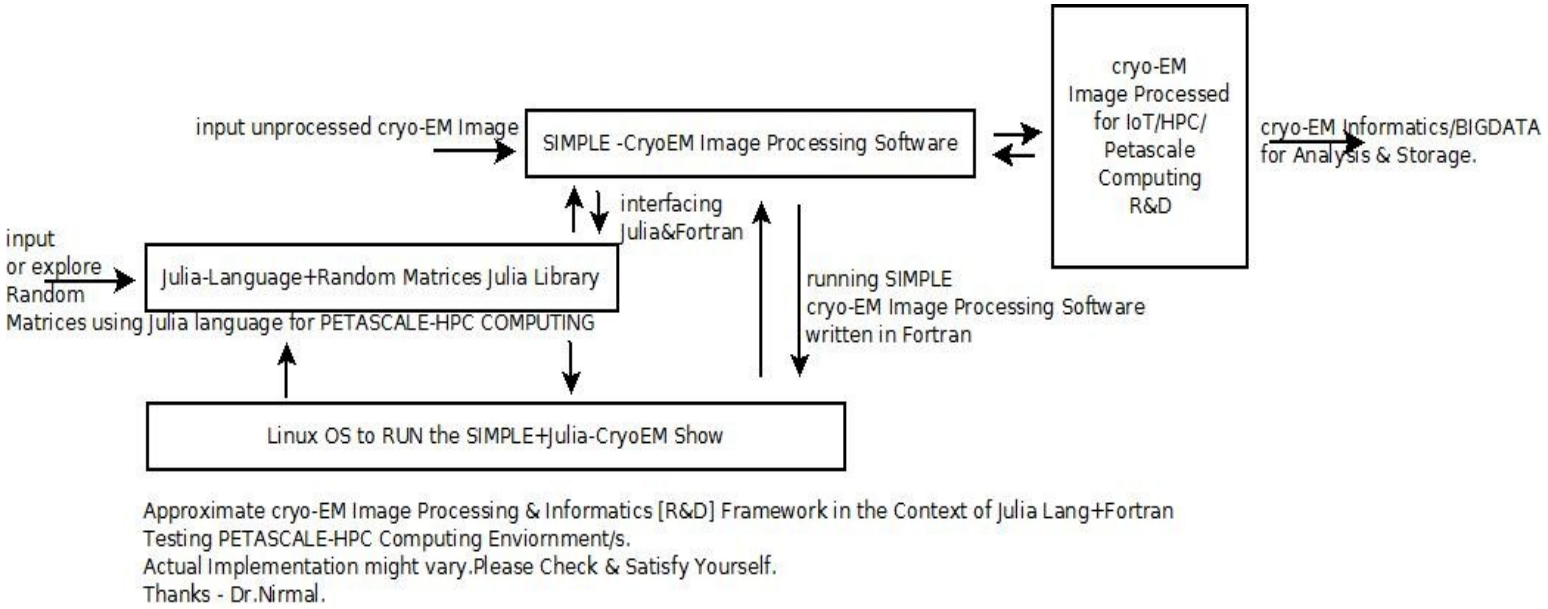
https://www.infoworld.com/article/2616709/new-julia-language-seeks-to-be-the-c-for-scientists.html
https://github.com/JuliaMath/RandomMatrices.jl
https://github.com/**Julia**Lang/**julia**
https://**juliacomputing**.com/case-studies/celeste.html
**https://www.nextplatform.com/.../julia-language-delivers-petascale-hpc- performance/**
**http://vixra.org/abs/1907.0201**

http://vixra.org/abs/1905.0126
https://simplecryoem.com/
https://simplecryoem.com/publications.html
https://www.ncbi.nlm.nih.gov/pubmed/22902564
https://www.ncbi.nlm.nih.gov/pubmed/24087878
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5854467/

https://github.com/leschzinerlab
https://en.wikipedia.org/wiki/Cryogenic_electron_microscopy
https://www.semanticscholar.org/...electron-microscopy.../ 231708acfbeeed6468d7ab33f07432fd56e256e1
cryoem.berkeley.edu/cryoem
https://academic.oup.com/nar/article/34/18/e125/3112136

**https://www.news-medical.net/.../Why-Cryo-EM-is-Gaining-Popularity-in- Structural-Biology.aspx**
**https://www.ebi.ac.uk/pdbe/emdb/help_pages/va_help.html/**
**https://www.worldscientific.com/worldscibooks/10.1142/10844**
**https://blogs.sciencemag.org/pipeline/archives/2013/08/16/an_hiv_structure_breakthrough_or_complete_rubbish**
**https://discourse.julialang.org/t/julia-vs-fortran-complaint/4366**

**[II] Cryo-EM Imaging & Informatics R&D Framework With [Julia+Fortran ] Software :**




**[ Figure I – Simple Suggestion About Julia+SIMPLE Cryo-EM Image Processing Software interfacing for PETASCALE Computing R&D ]**

**[III] My Acknowledgment/s :**

Special Thanks to all my Friends & Collaborators for their excellent encouragement. Non-Commercial R&D.

Non-Profit Academic R&D only.

**[IV] Some Related Information on Mathematics & Software Used :**

[a] https://repository.lib.fit.edu/handle/11141/736 / [http://hdl.handle.net/11141/736 ]

[b] math.uni.lu/eml/projects/reports/**random-matrices**.pdf

[c] https://www.ipht.fr/Docspht//.../t15/.../Slides:History+Cold_atoms.pdf

[d] https://arxiv.org/abs/1004.1356

[e] https://en.wikipedia.org/wiki/Julia_(programming_language)

**[ THE END ]**