Quantum Mechanics & Quantum Signal Processing Framework Based Cryo-EM Image Processing Using Higher Order Logic(HOL)/Haskell/Scala/JikesRVM/IoT Environment - An Innovative & Interesting Approach in the Context of Quantum Computing.

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Abstract & Inspiration :

“Anyone who is not shocked by quantum theory has not understood it.” - Niels Bohr.

As we all know,cryo-EM Image Processing is proving itself as a useful tool.In this context,we came across interesting and inspirational research papers titled - **Quantum approach to Image processing** by Mohammad Rastegari and **Quantum image processing?** by Mario Mastriani.In general,this approach could be applied to any Electron Microscopy Domain/s – SEM/TEM/AFM etc...

index words : quantum mechanics/cryo-EM Image Processing/HOL/Scala/JVM/IoT Environment.

An Introduction To Informatics & Image Processing Framework :

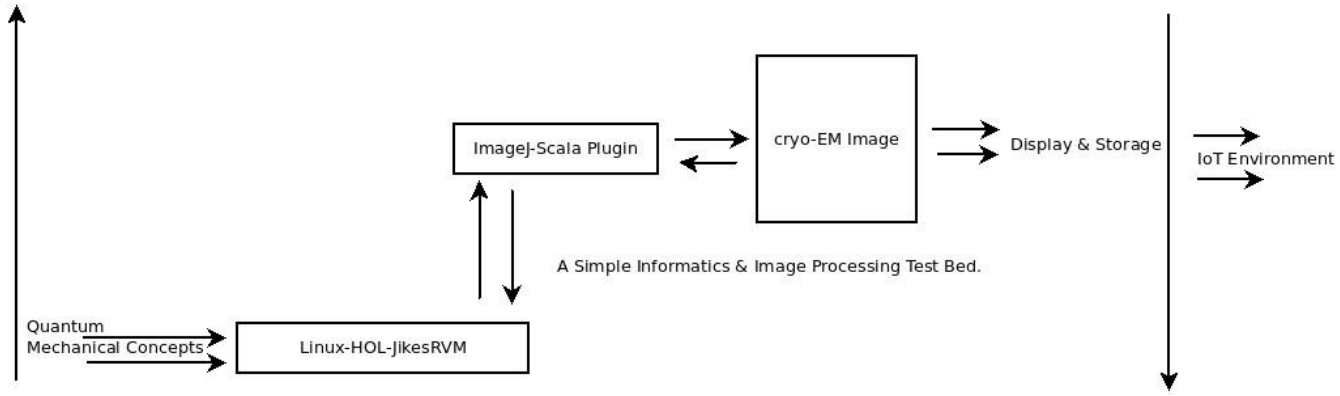

Figure I – Approximate Test Bed - Scala

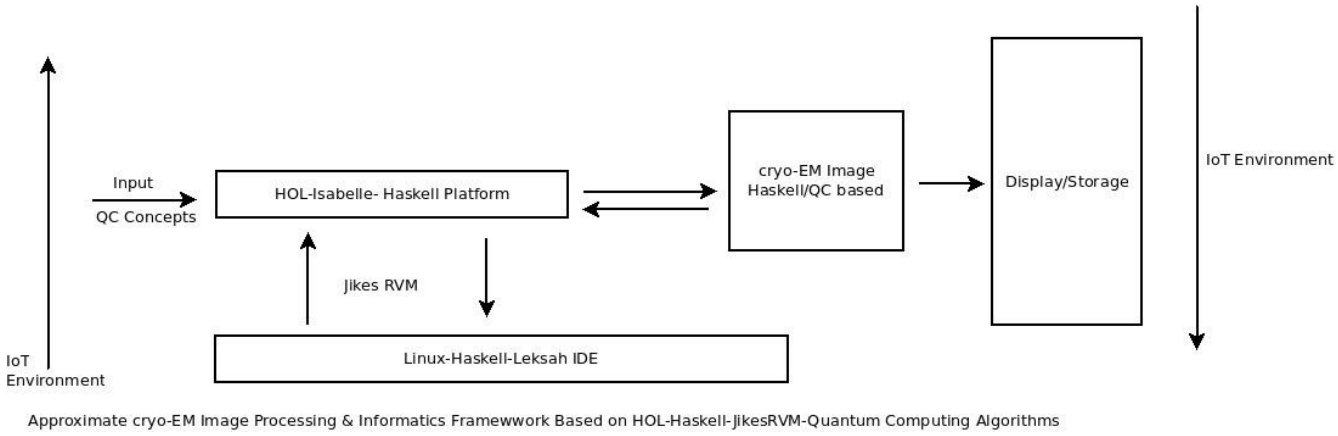

Figure II – Approximate Test Bed - Haskell

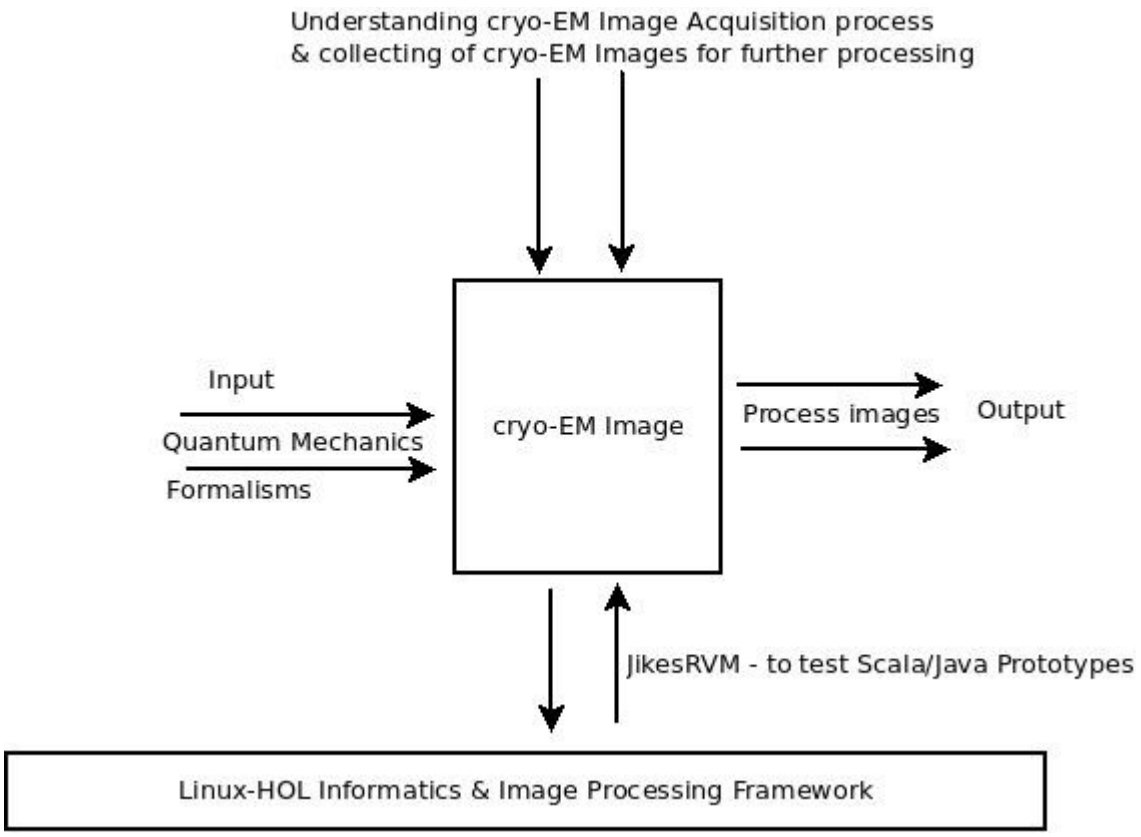

Figure III – Approximate QM Interaction Framework

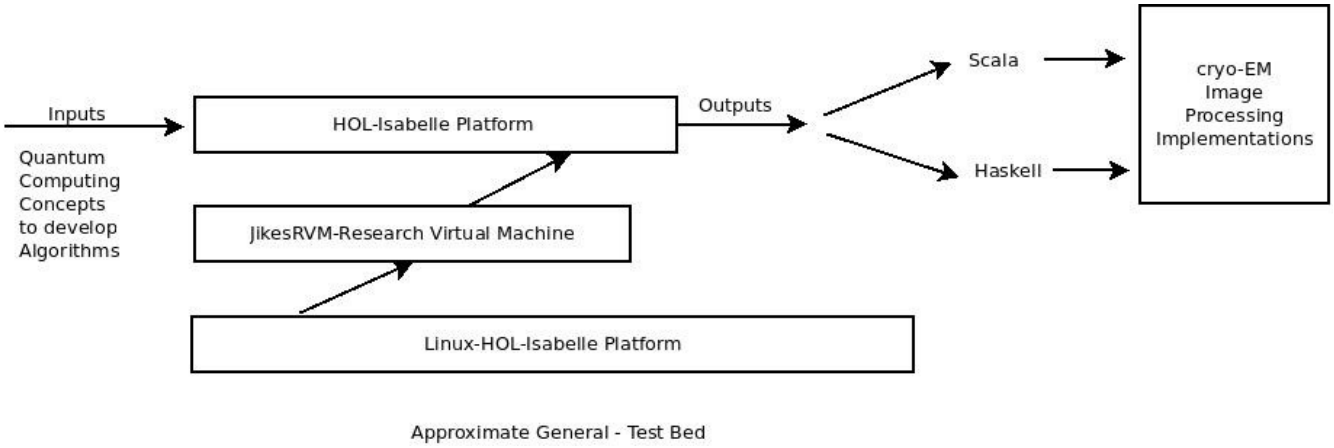

Figure IV – Approximate General – Test Bed.

R&D Analysis With Conclusions :

Quantum Mechanics is a major driving force behind all revolutionary technologies in the domains of practical computations.Hence this simple exercise.This is one of the pioneering technical communications in the dynamics of cryo-EM Image Processing Applications.In preparing this communication,we have used **Refs[1-7]** to develop **Figures[I-IV].**

Additional Information on Mathematics & Software Used :

Please Refer to Ref[4]& Ref[2] – to obtain more details.

https://www-users.cs.york.ac.uk/schmuel/

Quantum image processing? by Mario Mastriani - https://arxiv.org/pdf/1512.02942.pdf

https://ardeleanasm.github.io/Quantum-Computing-in-Haskell/

https://www.codeproject.com/Articles/1130092/Java-based-Quantum-Computing-library

https://www.codeproject.com/Articles/1131573/Grovers-Search-Algorithm-explained

https://www.quantiki.org/wiki/list-qc-simulators

https://pdfs.semanticscholar.org/35c2/6ac4da06666b8fcfa28afb46164a286dd777.pdf

https://www.research.ibm.com/ibm-q/learn/what-is-quantum-computing/

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References :

[1] http://legacydirs.umiacs.umd.edu/~mrastega/paper/final3.pdf - Quantum approach to Image processing by Mohammad Rastegari.

[2] https://sites.google.com/site/ijcitcfp/ijcit-content - D N T Kumar, L Yonggui, Q Wei, "Suggestion of Support Vector Machines as Computational Tools for the Analysis of Quantum Circuits," IJCIT v4 n1, pp.25-36, June 2012, ISSN: 0974-696X.

[3] Formalizing Image Processing in Higher Order Logic(hol) by Understanding and Using XML-Hol-Scala-JVM Software Framework Towards Processing of Cryo-Em/tem/sem Images Based on Levy Processes a Novel Suggestion - [http://vixra.org/abs/1709.0412http://vixra.org/abs/1709.0412]

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[5] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4788751/pdf/main.pdf - The Current Revolution in Cryo-EM by Edward H. Egelman/Department of Biochemistry and Molecular Genetics, University of Virginia, Charlottesville, Virginia,USA.

[6] https://www-users.cs.york.ac.uk/~schmuel/book/book1.html – Quantum Computing Book.

[7] A Technical Note on Hilbert Spaces as Mathematical Tools to Probe and Process Cryo-EM Images – An Architectural and Computational Point of View Using Higher Order Logic (HOL)/Scala/Java/JVM Software Environment by Kumar N.T. - Article DOI : 10.5958/0975-8089.2016.00016.6