

Probing Lambda Calculus/Quantum Lambda Calculus for Advanced Computing + Image Processing + BIG DATA + AI in the Context of Space Technology R&D Domains With IoT/HPC/Smart Devices Informatics → A Simple Idea Using HOL–Isabelle System.

[Exploring Scala For Next Generation Space Informatics Framework]

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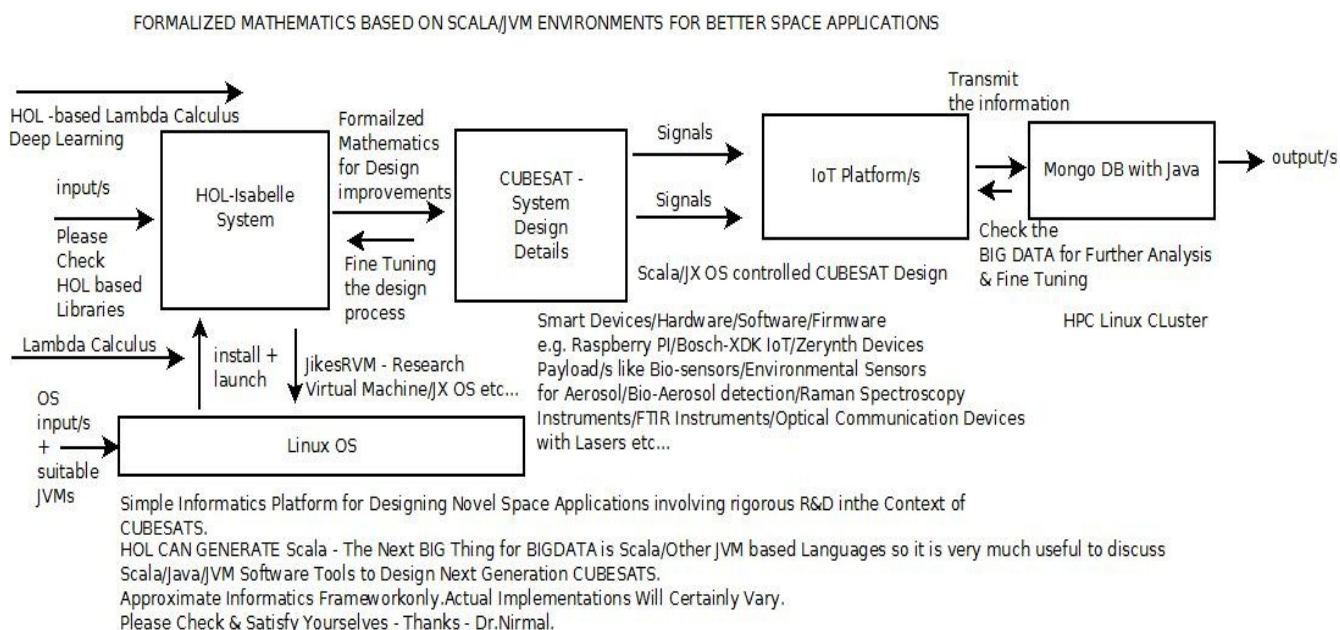
Independent Consultant	Informatics/AI/Imaging/Photonics/Nanotechnology/HPC R&D.
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[I] Abstract + Main Idea & Inspiration :

Designing Hybrid Computing Environment/s in the Context of BIG DATA/AI/IoT/HPC–High Performance Computing to Probe Space Informatics for R&D – A Novel Approach in Implementing Advanced Informatics Platforms Using Scala/Lambda Calculus/Quantum Lambda Calculus/HOL–Isabelle System/JVM/JikesRVM – Research Virtual Machine.

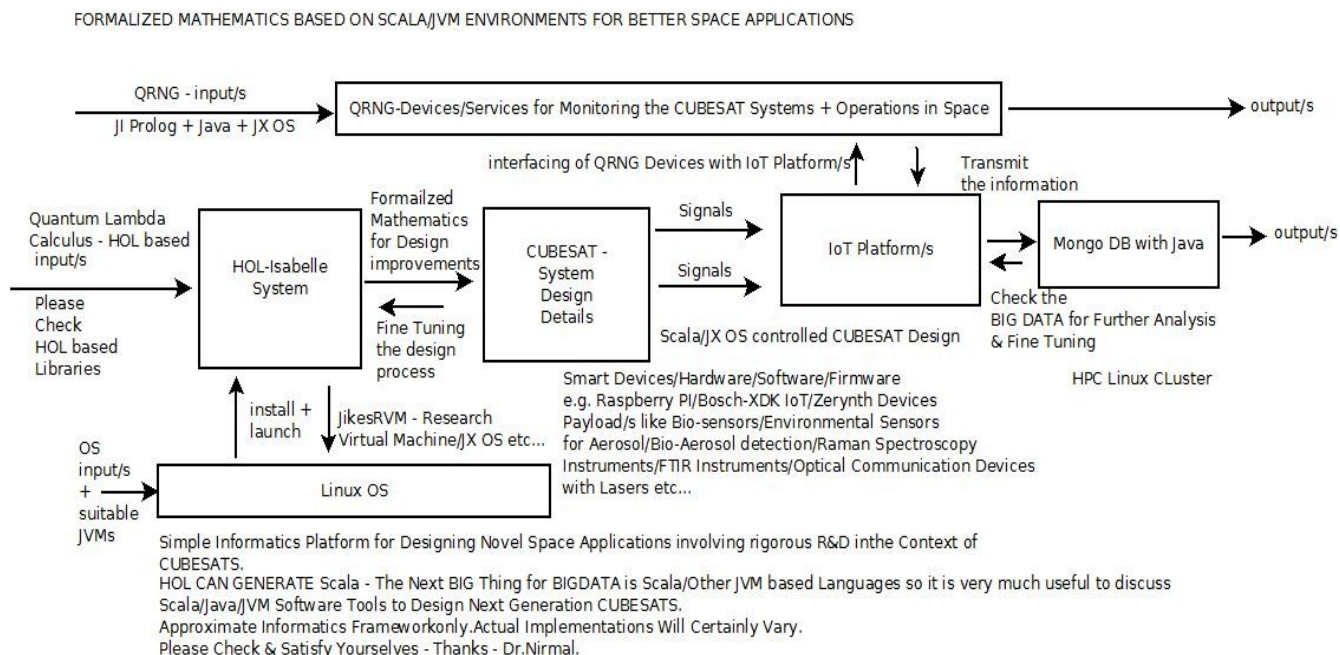
[index words/keywords] → easy to guess.

[II] R&D Informatics Framework Using HOL-Isabelle System/Scala/JVM/JikesRVM :



Using HOL based Lambda Calculus for Advanced Satellite Imagery + Applications

[Figure I – HOL/Isabelle based Lambda Calculus + Deep Learning Informatics R&D Framework]
[Designing a Work Flow Model → Space Informatics + Imaging]



[Figure II – HOL/Isabelle based Quantum Lambda Calculus + Deep Learning Informatics R&D Framework]
[Designing a Work Flow Model → Space Informatics + Imaging]

[III] Information on Lambda Calculus For Advanced Information Processing :

“Lambda calculus (also written as λ -calculus) is a formal system in mathematical logic for expressing computation based on function abstraction and application using variable binding and substitution (wikipedia).”

- What is Lambda Calculus: https://en.wikipedia.org/wiki/Lambda_calculus
- More materials: [A Tutorial Introduction to the Lambda Calculus](#)

*** <https://scala-lang.org/>

*** <https://github.com/tejdnk-2019-ShortNotes/Testing-EM-Images/blob/master/Nirmal-CUBESAT-HOL-Scala-Java-JVM-2020.pdf>

*** <https://www.jrebel.com/blog/what-is-lambda-calculus> && <https://www.jrebel.com/blog/parsing-lambda-calculus-in-scala>

*** <https://github.com/notional1/LambdaCalculus-java>

*** https://en.wikipedia.org/wiki/Lambda_calculus

*** <https://www.ams.org/journals/bull/1944-50-03/S0002-9904-1944-08090-7/S0002-9904-1944-08090-7.pdf> -Alonzo Church.

<https://archive.org/details/AnnalsOfMathematicalStudies6ChurchAlonzoTheCalculiOfLambdaConversionPrincetonUniversityPress1941> *****

*** <https://web.archive.org/web/20160729210437/http://cs.adelaide.edu.au/~pmk/publications/wage2008.pdf>

*** http://www.algebraic.net/detail/lambda_calculus/lambda_model.html

<https://www.researchgate.net/publication/314937543-Workflow-translation-and-dynamic-invocation-for-Image-Processing-based-on-OpenCV> ***

*** Full Abstraction for the Quantum Lambda-Calculus →
<http://perso.ens-lyon.fr/pierre.clairambault/popl20.pdf> →

“Quantum programming languages permit a hardware independent, high-level description of quantum algorithms. In particular, the quantum λ -calculus is a higher-order language with quantum primitives, mixing quantum data and classical control. Giving satisfactory denotational semantics to the quantum λ -calculus is a challenging problem that has attracted significant interest. In the past few years, both static (the quantum relational model) and dynamic (quantum game semantics) denotational models were given, with matching computational adequacy results. However, no model was known to be fully abstract “. → for future R&D involving Quantum Lambda-calculus as a promising tool.

*** <https://github.com/Villane/lambdacalculus/tree/master/src/lambda>

[IV] Our Short Technical Notes (((via))) Vixra.org :

- [a] <http://www.vixra.org/author/nirmal>
- [b] http://www.vixra.org/author/d_n_t_kumar
- [c] http://www.vixra.org/author/n_t_kumar
- [d] http://www.vixra.org/author/nirmal_tej_kumar

[V] Acknowledgment/s :

Sincere thanks to all my Mentors+Friends+Collaborators. Non-Profit R&D.

[VI] Important References :

- [a] <http://isabelle.in.tum.de/>
- [b] https://www.isa-afp.org/entries/Goodstein_Lambda.html
- [c] https://www.isa-afp.org/entries/Name_Carrying_Type_Inference.html
- [d] <https://www.isa-afp.org/entries/Complex.html>
- [e] https://www.isa-afp.org/entries/Deep_Learning.html
- [f] <https://www.isa-afp.org/entries/AWN.html>
- [g] <https://www.isa-afp.org/entries/FinFun.html>
- [h] <https://www.isa-afp.org/entries/LambdaMu.html> &&
<https://www.nms.kcl.ac.uk/christian.urban/Publications/nom-tech.pdf>
<https://brilliant.org/wiki/lambda-calculus>
<https://isabelle.in.tum.de/library/HOL/HOL-Proofs-Lambda/outline.pdf>
- [i] https://www.isa-afp.org/entries/Universal_Turing_Machine.html
- [j] <https://www.isa-afp.org/entries/LambdaAuth.html>
- [k] <https://www.isa-afp.org/entries/VeriComp.html>

[THE END]