

**An Insight into Higher Order Logic (HOL) based Ontology NeuroInformatics Framework by Considering Ontology Oriented Concepts & Language/s based on HOL/Grobner Bases/Scala/Jikes RVM/JVMTechnologies/IoT Computing Environments.**

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**Abstract :**

“Gröbner Bases Theory” & Ontology could be implemented as explained - An Insight into Higher Order Logic (HOL) based Ontology Neuroinformatics Framework by Considering Ontology Oriented Concepts & Language/s based on HOL/Grobner Bases/Scala/Jikes RVM/JVM Technologies/IoT Computing Environments.

**keywords :** explained in the abstract/title itself.

**\*\*\*\* Readers Please make a note :** This communication is written in free style.No particular format was followed.Intended for rapid publication.

## **I. Introduction & Inspiration :**

“RDF-Resource Description Framework as a common semantic foundation for healthcare information interoperability. Neuroinformatics stands at the intersection of [neuroscience](#) and [information science](#).”

**[Wikipedia.]**

### **[I] Ontology :**

“In computer science and information science, an ontology encompasses a representation, formal naming, and definition of the categories, properties, and relations between the concepts, data, and entities that substantiate one, many, or all domains”. **[Wikipedia]**

### **[ii] Neuroinformatics :**

“Neuroinformatics is a research field concerned with the organization of [neuroscience](#) data by the application of computational models and analytical tools. These areas of research are important for the integration and analysis of increasingly large-volume, high-dimensional, and fine-grain experimental data. Neuroinformaticians provide computational tools, mathematical models, and create interoperable databases for clinicians and research scientists. Neuroscience is a heterogeneous field, consisting of many and various sub-disciplines (e.g., [cognitive psychology](#), [behavioral neuroscience](#), and [behavioral genetics](#)). In order for our understanding of the brain to continue to deepen, it is necessary that these sub-disciplines are able to share data and findings in a meaningful way; Neuroinformaticians facilitate this”. **[Wikipedia]**

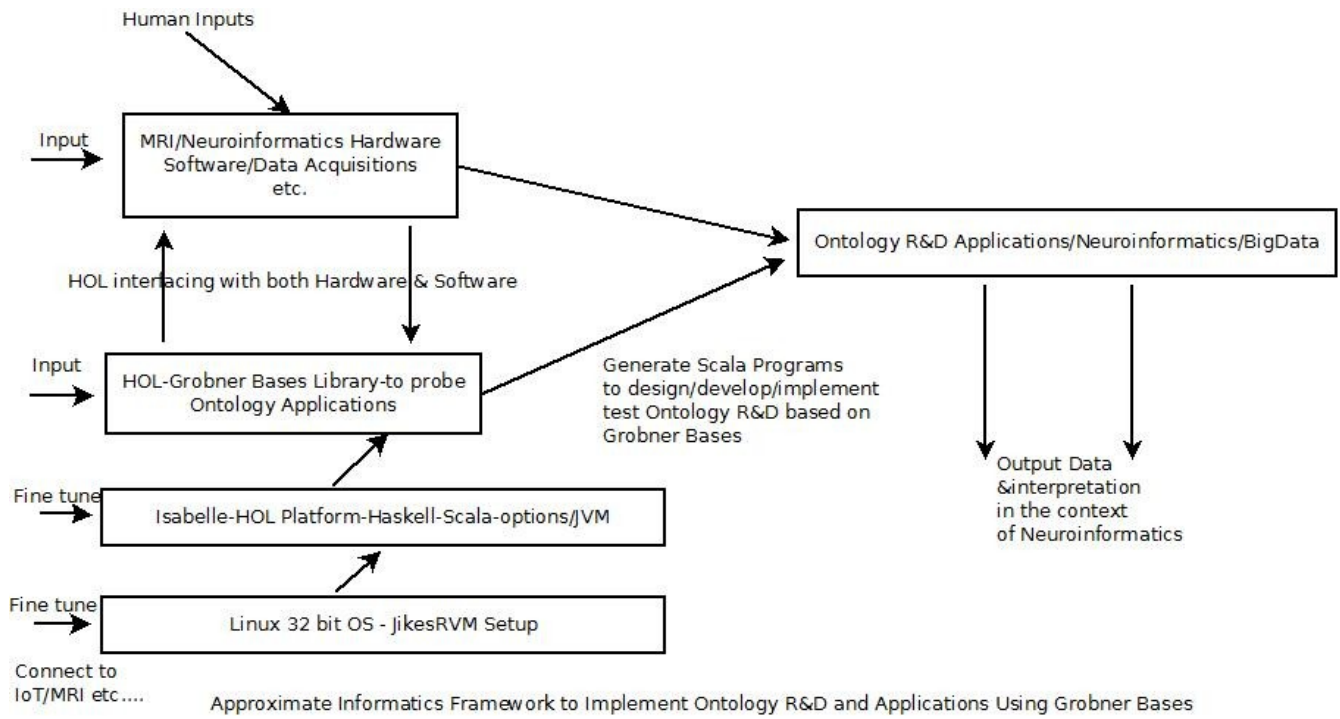
### **[iii] Higher Order Logic(HOL) :**

“The Isabelle theorem prover is an interactive theorem prover, a Higher Order Logic theorem prover. It is an LCF-style theorem prover, so it is based on a small logical core to ease logical correctness”. [Wikipedia](#)

### **[iv] Grobner Bases :**

“A **Gröbner basis** is a set of multivariate nonlinear polynomials enjoying certain properties that allow simple algorithmic solutions for many fundamental problems in mathematics and natural and technical sciences. “ - [From - [http://www.scholarpedia.org/article/Groebner\\_basis](http://www.scholarpedia.org/article/Groebner_basis)]

## II. HOL Based NeuroInformatics - Ontology Framework :



**Figure I – Our total overview of the main idea.**

### **III. Technical Information & Future Perspectives :**

Self Explanatory Informatics Framework is implemented and presented.

Holds lot of promise.

Please note - actual implementation could vary to some extent.

Kindly check.

This is one of the pioneering R&D Note/Technical/Short Communications in this promising domain to probe “Neuro-informatics”.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2695392/pdf/fnins-03-060.pdf>

Ontologies for neuroscience: what are they and what are they good for? Stephen D. Larson\* and Maryann E. Martone\* Department of Neurosciences, University of California, San Diego, CA, USA

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### **IV. Acknowledgement :**

Special Thanks to all & this work is meant for non-profit R&D only.No competing financial interest/s is/are declared in writing and presenting this technical communication.

## V. Additional Information & Guidelines on Mathematics & Software Used :

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**THE END**