



Algebra is the Language of Mathematics & Algebraic Philosophy is the Luggage of Mathematics

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ABSTRACT

How & why the Algebraic Philosophy comes into existence is the fundamental question posed by philosophy-investigators. The so-called Doctors of Philosophy at one time or the other might have broached the idea of an iota of Algebraic Philosophy. But they could not have nurtured it to develop into a Research Paper like this one which consolidates several kinds of philosophically valued-instances to throw light on algebraical notions. Within the boundaries of matured thought-processes and encountered interviews with intervals both in the public as well as private domains to socially familiarizing Algebra as the language of mathematics, our ancestral mathematicians had laid down the foundation stone called an Algebraic Philosophy.

It is an unbecoming of modern mathematical species which are rather not impartial and tacitly quiet to eulogize the Algebraic Philosophy just like the invisibility of the formations of the Natural Resources (Gold, Platinum, Copper, etc.) in the Earth's underground by natural means of different and variable natural ever-green-alive processes. That apart, it is essential to know that the mathematics of any language must have indeed existed for the mathematics of natural sounds or music besides that of the natural light are already established. But Algebra can be defined as the language of mathematics itself. This paper identifies Algebra as the language of mathematics and hence promotes the turn and term of Algebraic Philosophy as the luggage of mathematics. The aim is understanding origins of Algebraic Philosophy in its smart-technological access to Research-ability through the modalities of Research for a research-paper-production

Keywords: Algebra, Developers, Language, Luggage, Mathematics, Natural, Origins, Philosophy, Resources

1. EVERY RESEARCH HAS THE BEGINNING OF UNIQUE INDEX



2. INTRODUCTION

The mathematics of a language must have indeed existed. But Algebra can be defined as the language of mathematics itself. This is proved by the very definition of Algebra which is said to be that Algebra is the branch of knowledge (maybe as known to us as mathematics) which treats the representation and manipulations of relationships, be it the numerical numbers, values, vectors, properties of quantities, abstract formal structures of sets

/groups/rings/modules, operations of reunifications and reductions to express general relationships that hold universal good for all. In a nutshell, it is a shortcut of general statements of relations which utilizes letters and other symbols, alphabetical or otherwise, to represent specific sets of description of such relations.

2.1 RESEARCH METHOD & METHODOLOGY

Mathematical algebraic concepts-mathematical algebraic issues-mathematical algebraic contexts in this Philosophical World of pure-mathematicians, applied mathematicians and the multi-disciplinary mathematicians constitute the constructive educational backbone in this structured human world of ours on the Planet of the Earth where God is believed to be a philosophical mathematician Himself. As a necessary and essential conditionality, secondary sources of algebraic research quality, algebraic research quantity and algebraic research data supported by extensive philosophical morality in their state of unabated plenty availability across the reputed academic mathematical resources across the plural disciplines have got to be relied upon. This provided an opened umbrella's spreadeagle-coverage for the Paper.

2.2 LITERATURE SURVEY'S THRONE & CROWN QUALITY EDITION

Abstract Consequence and Logics: Essays in honor of Edelcio G. de Souza (2020)

The book titled "Abstract Consequence and Logics" aims to encompass and consolidate Edelcio's primary interests in logic, mathematics, and philosophy. Edelcio's objective is to formally model and represent the fundamental philosophical concept of quasi-truth within the realm of philosophy of science. This research endeavors to establish the formal boundaries of empirical scientific knowledge concerning reality. Additionally, recognizing the significance of multi deductive logic in the abstraction and unification of theories, Edelcio naturally delves into the domain of model theory.

The concept of considering logics as structures is elucidated, highlighting the relationship between structures and axioms. Specifically, the notion of axiomatization is explained from a model theoretical perspective. Furthermore, the position of logical structures among other mathematical structures is discussed, providing an overview of the diverse universe of logical structures. Subsequently, the book explores axioms for logical structures, initially in an abstract context, and then delves into the treatment of negation in a second part.

3. HISTORICAL USE OF THE TERM ALGEBRA

It is crucial to acknowledge that throughout history, the term algebra has encompassed diverse branches of mathematics that extend beyond our contemporary understanding of algebra. Consequently, certain earlier philosophical deliberations pertaining to mathematics may employ the term algebra in a broader context that does not necessarily align directly with our present comprehension

4. HISTORY & HISTORICAL USES OF ALGEBRA

In the 9th century, a renowned Arabic mathematician named Muhammad al-Khwarizmi authored a book titled "The Book of Restoring and Balancing," which elucidated the principles of algebra. Although algebra had already been developed by mathematicians in Greece and India, al-Khwarizmi's comprehensive treatment of the subject in his book propelled it to become a popular medieval publication. The Arabic term for "the restoring" in the book's title, al-jabr, eventually gave rise to the word algebra in English. Furthermore, al-Khwarizmi's own name became the origin of another mathematical term in the English language, algorithm.

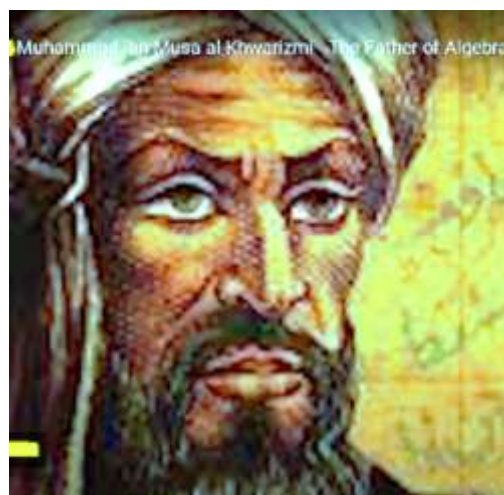


Image -Source: al-Khwarizmi, Father of Algebra. <<https://muslimheritage.com/muhammad-ibn-musa-khwarizmi-father-algebra/>>

During the Middle Ages, the Islamic world of the Arabs emerged as the primary hub for scientific knowledge, surpassing Europe in this regard. While Europe largely neglected the Greek classics of Plato and Aristotle, the Arabs delved into their study. Their particular focus lay in the fields of medicine and astronomy, with astronomy necessitating meticulous measurements and calculations, thereby honing their mathematical expertise.

In the 19th century, some thinkers like Augustus De Morgan and Mary Everest Boole explored the philosophical implications of algebra and its formal structures. Their work focused on the connection between logic and algebra, and the potential of using algebraic methods to analyze philosophical concepts. By way of historical interpretations of historical writings, for example, Mary Everest Boole's "Philosophy and Fun of Algebra," deliberate, debate and discuss the philosophical implications of learning algebra for mental discipline and intellectual development as accruing advantages from studying algebra,



Mary Everest Boole

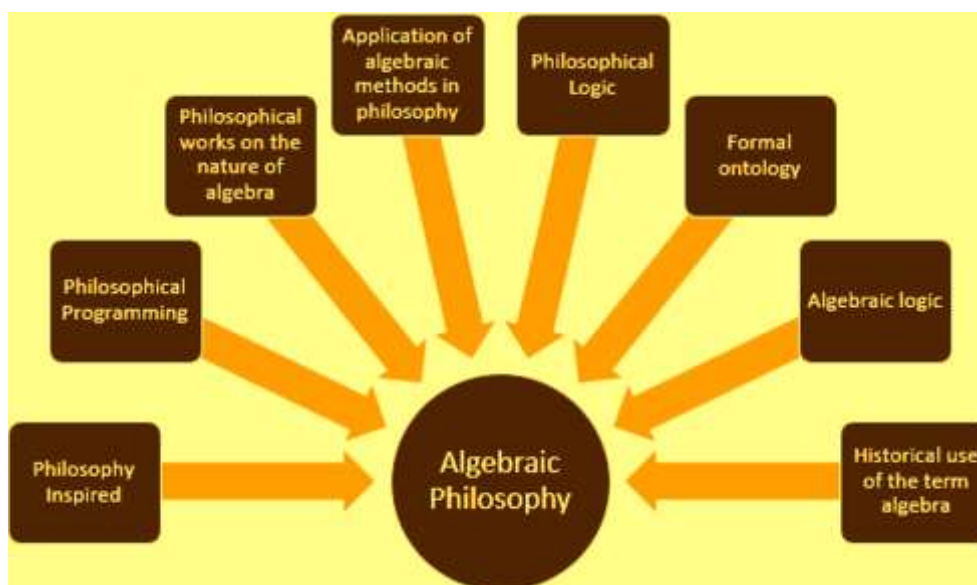
Image Source: <<https://vedicmathschool.org/mary-everest-boole-life-mathematics-story/>>

5. CONTEMPORARY APPLIED ALGEBRAIC APPLICATION

Modern philosophers depend on employing formal tools, such as logic and algebra, to represent ontological structures in formal Ontology. This practice is referred to as the application of formal methods in ontology. The emerging field of philosophical programming investigates the convergence of philosophy and computer science, where numerous researchers leverage algebraic methods to model and analyse philosophical concepts within computational complex systems

6. ALGEBRAIC PHILOSOPHY'S CHARTERED LUGGAGE

Algebra is a widely recognized school of thought for specific philosophy directly referred to as the Algebraic Philosophy with possibilities such as the following.



7. APPLICATION OF ALGEBRAIC METHODS IN PHILOSOPHY

Various approaches exist for utilizing algebra and its associated mathematical techniques to examine and represent philosophical concepts. This encompasses using algebra and related techniques to analyze and pre-model philosophical concepts.

➤ *Algebraic logic*

This area utilizes algebraic structures like lattices or Boolean algebras to represent and study logical relations and systems. Alternatively, Algebraic logic is a field that employs algebraic structures to depict and investigate logical relations and systems.

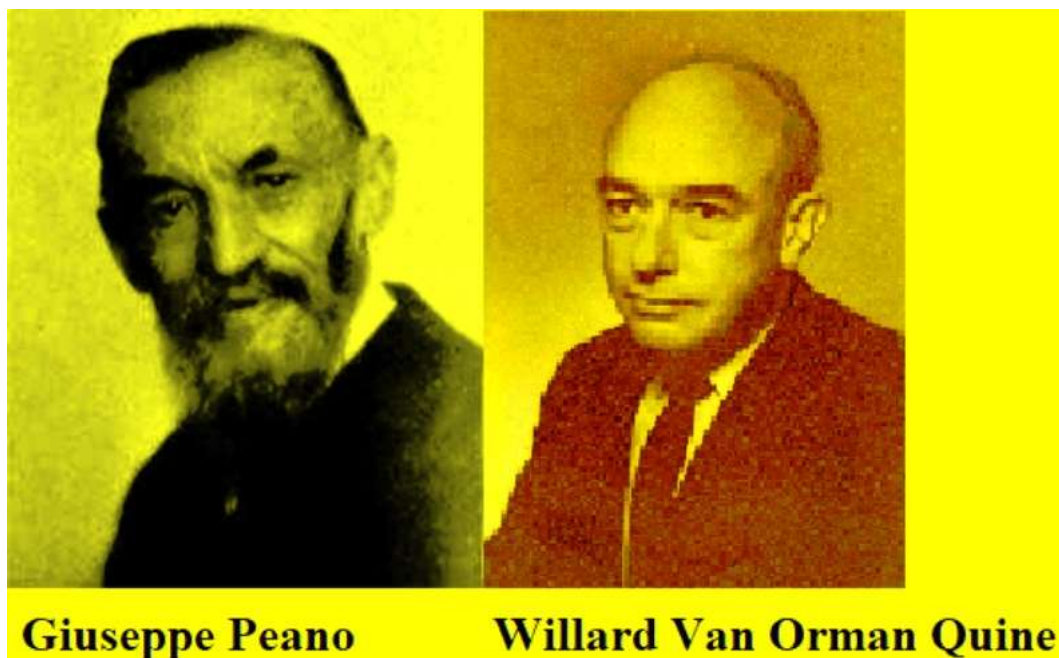
Alfred Tarski, J. Michael Dunn, and Gary Hardegree are the men of talent in this line of contribution.



<Image source : See 2,3,4 under Refences>

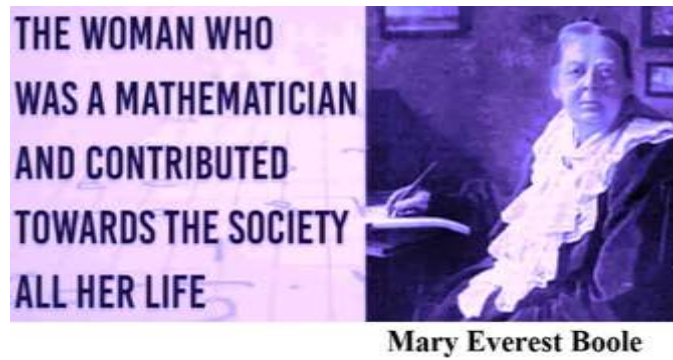
➤ *Formal ontology*

Formal ontology, a branch of philosophy focused on the nature of entities and their properties, often incorporates set theory and other mathematical tools for precise representation and reasoning. This approach allows for a rigorous examination of the fundamental concepts and relationships within ontology, providing a structured framework for analyzing and understanding the nature of existence. By utilizing mathematical tools, formal ontology aims to establish a systematic and logical foundation for exploring the nature of reality. Giuseppe Peano and Willard Van Orman Quine are experts in this area.



8. PHILOSOPHICAL WORKS ON THE NATURE OF ALGEBRA

Certain historical or contemporary works delve into the philosophical implications and interpretations of algebraic concepts and practices. For instance, Mary Everest Boole's "Philosophy and Fun of Algebra" explores the intellectual and educational value of studying algebra beyond mere manipulation of symbols.



Mary Everest Boole

Image Source: <<https://vedicmathschool.org/mary-everest-boole-life-mathematics-story/>>

It's important to recognize that over time, the concept of algebra has included various branches of mathematics that go beyond what we currently understand as algebra. As a result, some past philosophical discussions about math might use the term algebra in a wider sense that doesn't exactly match our current understanding. Hence, there have been historical usages of the term algebra as was conveniently felt by ancient philosophers.

9. ALGEBRAIC PHILOSOPHICAL SCHOOL OF PHILOSOPHICAL MOVEMENT

If Algebraic Philosophy doesn't refer to a specific and/or well-established philosophical school and/or movement, it can still be challenged and negated. There are several possibilities as to the origins and developers on the side of the Algebraic Philosophy interpretation.

Tabulation of Possibilities					
Possibility	Source	Nature	Origin	Tools	Developers/ Founder
First Possibility	Philosophical problems of abstract thinking, relation between logic & math and formalizing arguments of philosophical value.	Philosophy inspired	Algebraic Concepts	Algebraic methods	Alfred North Whitehead & Bertrand Russell & Willard Van Orman Quine & Robert Stalnaker
Second Possibility	Logical Systems	Philosophical logic	Sub-fields of logic	Algebraic methods	Alfred Tarski, Leon Henkin and J. Michael Dunn
Third Possibility	Historical interpretations	Philosophy of Philosophical implications	Fun of Algebra connected with logic and Algebra.	Studying Algebra	Mary Everest Boole & Augustus De Morgan
Fourth Possibility	Philosophical Programming	Intersection of philosophy/ philosophical concepts and computer science	computational systems	Algebraic methods	Alan Turing & Ada Lovelace

10. PHILOSOPHICAL POSSIBILITIES ENROUTE ALGEBRA

Firstly, Philosophy inspired by the concepts and methods of Algebra attracts our mind.

Several philosophers have delved into the possibilities of employing algebraic tools and concepts in order to scrutinize philosophical quandaries. This engaged the following.

- Formalization of philosophical arguments

Using algebraic structures to represent and manipulate philosophical concepts and arguments, aiming for greater clarity and precision. The process of formalizing philosophical arguments involves transforming them into a structured and logical form. This allows for a clearer analysis and evaluation of the arguments, as well as facilitating communication and understanding among philosophers. By applying formal methods, such as symbolic logic or argumentation theory, philosophers can represent the premises and conclusions of an argument using precise language and symbols. This formalization

helps to get rid of ambiguity and subjectivity, enabling a more rigorous examination of the reasoning behind philosophical claims. Additionally, formalization allows for the identification of fallacies or weaknesses in arguments, aiding in the development of stronger and more robust philosophical positions.

- Exploring the nature of abstract thinking

This is also known as investigating the essence of abstract cognition. Drawing parallels between the symbolic manipulation in algebra and the abstract reasoning in philosophy. Drawing comparisons between the symbolic manipulation in algebra and the abstract reasoning in philosophy allows for a deeper understanding of the underlying principles in both disciplines. By examining the similarities between these two fields, one can uncover the shared reliance on logical thinking and the ability to analyze complex concepts. This connection highlights the importance of critical thinking skills in both algebraic problem-solving and philosophical inquiry.

- Exploring the correlation between mathematics and logic

Also known as studying the relationship between mathematics and logic, this implies investigating how algebraic structures can be used to model logical systems and vice versa. Elaborated, this is explained as follows.

- Discovering the fascinating connection between algebraic structures and logical systems, and how they can be mutually utilized for modeling purposes.
- Unveiling the intriguing relationship between algebraic structures and logical systems, and exploring their potential for modeling various phenomena.
- Delving into the realm of algebraic structures and logical systems, uncovering their interplay and their applications in modeling diverse scenarios.
- Embarking on a journey to explore the symbiotic relationship between algebraic structures and logical systems, and their profound implications in the realm of modeling.

Configured from differing philosophical and mathematical disciplines, the above are provided by the following wisest folk of the world of mathematical religion.



Secondly, philosophical logic dependent Algebraic methods attract our mind.

This is an area which focuses on utilizing algebraic structures to model and analyze logical systems. It's a well-established subfield of logic with grand historical background and devoted research fans of researching fellow-feeling-communities. Following highlights are helpful.

- The field of philosophical logic and algebraic methods is dedicated to the application of algebraic structures in the modeling and analysis of logical systems. This subfield of logic has a long-standing history and is supported by active research communities.
- Within the realm of philosophical logic and algebraic methods, the emphasis lies on the utilization of algebraic structures for the purpose of modeling and analyzing logical systems. This well-established subfield of logic boasts a significant historical background and is accompanied by dedicated research communities.
- The domain of philosophical logic and algebraic methods is centered around the use of algebraic structures to effectively model and analyze logical systems. With a rich historical background, this subfield of logic has garnered the support of dedicated research communities.
- The area of philosophical logic and algebraic methods is primarily concerned with employing algebraic structures to model and analyze logical systems. This subfield of logic has a well-established presence and is backed by dedicated research communities with a rich history.

Developers of algebraic logic are notably as seen hereunder.



11. CONCLUSION

This paper emphasizes the existence of a singular and well-defined Algebraic Philosophy that is widely accepted. Algebraic philosophy has been applied in different ways and contexts, serving as a unified school of thought that opens up rational possibilities. By examining the origins and developers of Algebraic Philosophy, as well as considering the provided details and accumulated knowledge, one can gain a self-informative understanding. Academic circles often delve into specific interpretations, origins, and developers, shedding light on the diverse possibilities within "Algebraic Philosophy". Hence, it can be seen as an umbrella term encompassing various approaches that utilize algebraic or formal methods in philosophy.

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