Collatz Inverse Method by Physicist Ion Murgu, From OHIO, USA

Collatz Conjecture Unique Solution Collatz Table2To3
Murgu Table2To3
Infinite Upward Connections — Unique Downward Path to Unity
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Resulted from Collatz Conjecture new Group Theory Structure

and Murgu Inverse Method used for.

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0.1 Introduction

For decades, investigations into the Collatz Conjecture have relied heavily on brute-force numerical verification or localized trajectory tracking. While these methods confirm behavior up to high computational limits, they obscure the macro-algebraic order of the system.

The fundamental impasse of the problem lies in the apparent chaos of odd-to-even node transitions. This paper resolves that impasse by demonstrating that when the infinite domain of odd integers is mapped via Modulo-6 residues, the randomness disappears.

Instead of treating the $3n+1$ map ($Collatz - Patterns$) as sequences of unpredictable jumps $uncontroled{-}divergences$, our framework proves that numbers move through infinite, interconnected "engines." By analyzing the global properties of these Linear Engine Triads (LET) within the Murgu Table2To3 matrix, we establish a fixed coordinate system for infinite node connectivity, providing a logical pathway toward a complete structural proof. For Mathematicians Collatz Conjecture was Solved via its Unique Solution Collatz Table2To3 ($Murgu - Table2To3$)
Murgu Table2To3 Treated as Functions and Formulas in a new Coordinate System Collatz Conjecture dedicated, contain all Collatz Connections Nodes, one by one,and include in theirs Mathematical format Murgu - Collatz Unicity.
$Murgu - Collatz - Unicity$
But for Math Low Skilled by April 2024 we tried to explain it and any time maybe used excesses in.
As Collatz Conjecture Solved bring in Mathematics and Science important new aspects, here will try to remark those and to rewrite solution only following methods used, new formulas , new structure, etc., as Mathematics legacy of everything included in solution was multiple time explained.

0.2 Short History

Collatz Table2To3 as Table2To3 for Collatz Conjecture Analytic started in the same way as everyone did, with a small difference . We begin to make analytic to see eventually any proprieties to appropriate conjectures as $(2n+1)$, even $(n+1)$, $(4n+1)$ And to 2 Important for Collatz Conjecture as small revelations for, $(3n-1)$ and $(3n+3)$ and $3n-3$). May seem foolish , but this multiple analytics
https://climaticdisorder.com/hstp/pagei/murgu_3xplus3.html
https://climaticdisorder.com/hstp/pagei/mcvr_roots.html
murgu_3xplus3_conjecture.html

https://climaticdisorder.com/hstp/pagei/murgu_collatz_conjecture_perfect_grid_to_infinity.html
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0.3 Collatz Conjecture Domain

Collatz Conjecture is valid only in Positive Integers <hr> in negative loss its primary sense and is mirrored in Positives as a New Conjecture
 MCVR or Murgu Conjecture Vicious Redundancy.

0.3.1 Definition of the Collatz Conjecture Domain

The operational universe of this framework is strictly confined to the set of positive integers, denoted as:

$$\mathbb{Z}^+ = \{1, 2, 3, 4, \dots\}$$

The behavior of any element $x \in \mathbb{Z}^+$ under the classical Collatz mapping is determined by the piecewise function $f : \mathbb{Z}^+ \to \mathbb{Z}^+$, defined as:

$$f(x) = \begin{cases} \frac{x}{2} & \text{if } x \equiv 0 \pmod 2 \\ 3x + 1 & \text{if } x \equiv 1 \pmod 2 \end{cases}$$

By restricting the domain entirely to $\mathbb{Z}^+$, we eliminate the trivial loops found in the negative integer domain (e.g., the $-1, -5$, and -17 cycles), ensuring that our structural analysis focuses purely on the unidirectional global connectivity of positive numbers.

0.4 Foundations of the Domain and the MCVR independent conjecture

1. First need to Understood "Collatz Conjecture Domain" is Positive Integers Only as (see MCVR) into Negative Integers Loss its Fundamental sense from start:
$(3 \times (-5) + 1) = (-15 + 1) = -14(-14) : 2 = -7$
$(3 \times (-7) + 1) = (-21 + 1) = -20(-20) : 4 = -5$

Then Collatz Conjecture, as see in examples loss its sense and became a new Independent Conjecture named MCVR (3x -1). MCVR have Perfect Mirrored Image into Positive of this aspect, as to make easy infinity sign (-) portability into all used examples. See up example mirrored :
$(3 \times 5 - 1) = (15 - 1) = 14(14) : 2 = 7$
$(3 \times 7 - 1) = (21 - 1) = 20(20) : 4 = 5$
2. To define Conjecture Functional Divergence need to follow an example of a Collatz Conjecture Pattern Odds way. I chose as starter 79983, only odds as easy to can revel divergence:
79983, 119975, 179963, 269945, 202459, 303689, 227767, 341651, 512477, 192179, 288269, 108101, 20269, 7601, 5701, 1069, 401, 301, 113, 85, 1, 1
Now, can see Collatz Conjecture Patterns are like Labyrinth where divergence handle it via oscillating values. Collatz Conjecture Patterns propriety was for 88 Years a scaring Issue for Collatz Conjecture as to not fall at any Integers Big Values into infinity Instead Of Unity.

0.5 Collatz Conjecture New Group Theory Structural Re-partition.

All Math Rigor of Murgu Inverse Method Legacy been over demonstrated in Old Materials by 2023 until 2026 , then here a part of them or all will be considered solved.
After a lot of work on Collatz Conjecture using Collatz Procedures and not any positive results, became clear, solution for Collatz Conjecture will be not obtained via old method, even will use

Modulo-3 combined with Modulo-2. Then, the best idea was Murgu Inverse Method. This give a start to a lot of new work lucking for any common proprieties which to offer any chance for solution. Collatz Conjecture Murgu Inverse Method use Collatz Conjecture procedure

$$(3n+1)$$

final state after division , then will be Odd To Odd. Expressed as :

$$(3n+1) = (2^k)D$$

Where D Odd Positive Integer CCM.0.1

Then Collatz Conjecture Murgu Inverse Method Formula:

$$((2^n)D - 1) = 3 \times Q$$

CCM.0.2 Q is n , and natural D and Q are Positive Odds Integers.
Murgu Inverse Method Formula lead, after multiple usage to next step, analyze of Collatz Conjecture using as to observe any Integers common proprieties as to explore inverse structural relationships. This exploring inverse structural relationships as lucking for Integers common proprieties, started implied grouping Integers ,a Group Theory Method of dividing whole positive Integers into Grids of n elements <hr> , and we started with Grids of 3(Modulo-3) which used for a while detected different propriety between 2 additional grids. That forced, in any sense,
 Grids of 6 - Modulo-6. Collatz Conjecture using Murgu Inverse Method Formula

0.6 Collatz Inverse Method Legacy

Collatz Inverse Method Legacy is natural. Using Murgu Inverse Method Formula for Collatz Conjecture new Group Theory Structure, lead to discovery on Grids of 6 Positive Integers Grids any common Proprieties for Grid Members. This observations over
$(1+6i), (2+i\times 6), (3+i\times 6), (4+i\times 6), (5+i\times 6), (6+i\times 6)$
brought also a 3 New Formulas and rules on.
Important may be , first , even if those formulas are valid for evens too, to make easy our work, to exclude for a Time Evens as we have a Evens Formula which will reintegrate all evens back.

$$2^k D = every - odd - D - Infinity - Collatz - Connections - Nodes$$

This do not dissipating Collatz Conjecture sense.
Then , for WORK on solving Collatz Conjecture we remain to analyze on grids of 6 only 3 elements proprieties. Those are:
$(1+6i), (3+i\times 6), (5+i\times 6)$
Analyze lead also to give a formal Math name for every one , which to mark verbal theirs proprieties.

1. - $(1+i\times 6)$ was named:

Logical Eternal Triad 1 or Logical Engine Triad 1

$$LET_{1i}$$

and Theirs Role and Legacy in Collatz Conjecture new Group Theory Structure was brought by 2024 but theirs Formula which will became one of Collatz Conjecture Functional Divergence Linear Functions :

$$Q_{1i} = \frac{2^{2k+2}(1 + i \times 6)}{3}$$

where $(1 + i \times 6)$ is LET_{1i} and Q_{1i} an Odd which can be an LET_{1i} or LET_{2j} or LDN_k .

2. - $(3 + i \times 6)$ was named:

Logical Dead Nodes (LDN_k) or
Logical Collatz Conjecture Closures
as Collatz Inverse Method revealed to void any formulas for those.

$$\frac{2^k \times (3 + k \times 6)}{3} \neq O_k$$

Where O_k an Odd Positive Integer and $(3 + k \times 6)$ an LDN , with k = 0 to Infinity.
Is time to remind Collatz Inverse Method Reveal UP Connections , when Collatz Procedures DOWN Collatz Connections.
This avoided equality Formula say LET Do Not have up connections and brought 2 LDN-Rules.

1. A Collatz Pattern Starting from a LDN never will Meet another LDN in its way to Unity.
2. A Collatz Pattern Starting from a LET , never will Meet a LDN in its way to Unity.

3. - $(5 + i \times 6)$ was named:

Logical Eternal Triad 2 or Logical Engine Triad 2

$$LET_{2j}$$

and Theirs Role and Legacy in Collatz Conjecture new Group Theory Structure was brought by 2024 but theirs Formula which will became one of Collatz Conjecture Functional Divergence Linear Functions :

$$Q_{2j} = \frac{2^{2l+1}(5 + j \times 6)}{3}$$

where $(5 + i \times 6)$ is LET_{2j} and Q_{2j} an Odd which can be an LET_{1i} or LET_{2j} or LDN_k .

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$$Q_{2j} = \frac{2^{2l+1}(5 + j \times 6)}{3}$$

$$(1 + 6i), (2 + i \times 6), (3 + i \times 6), (4 + i \times 6), (5 + i \times 6), (6 + i \times 6)$$

0.7 Analysis of the Table

As shown in Figure 1, the row progression demonstrates...

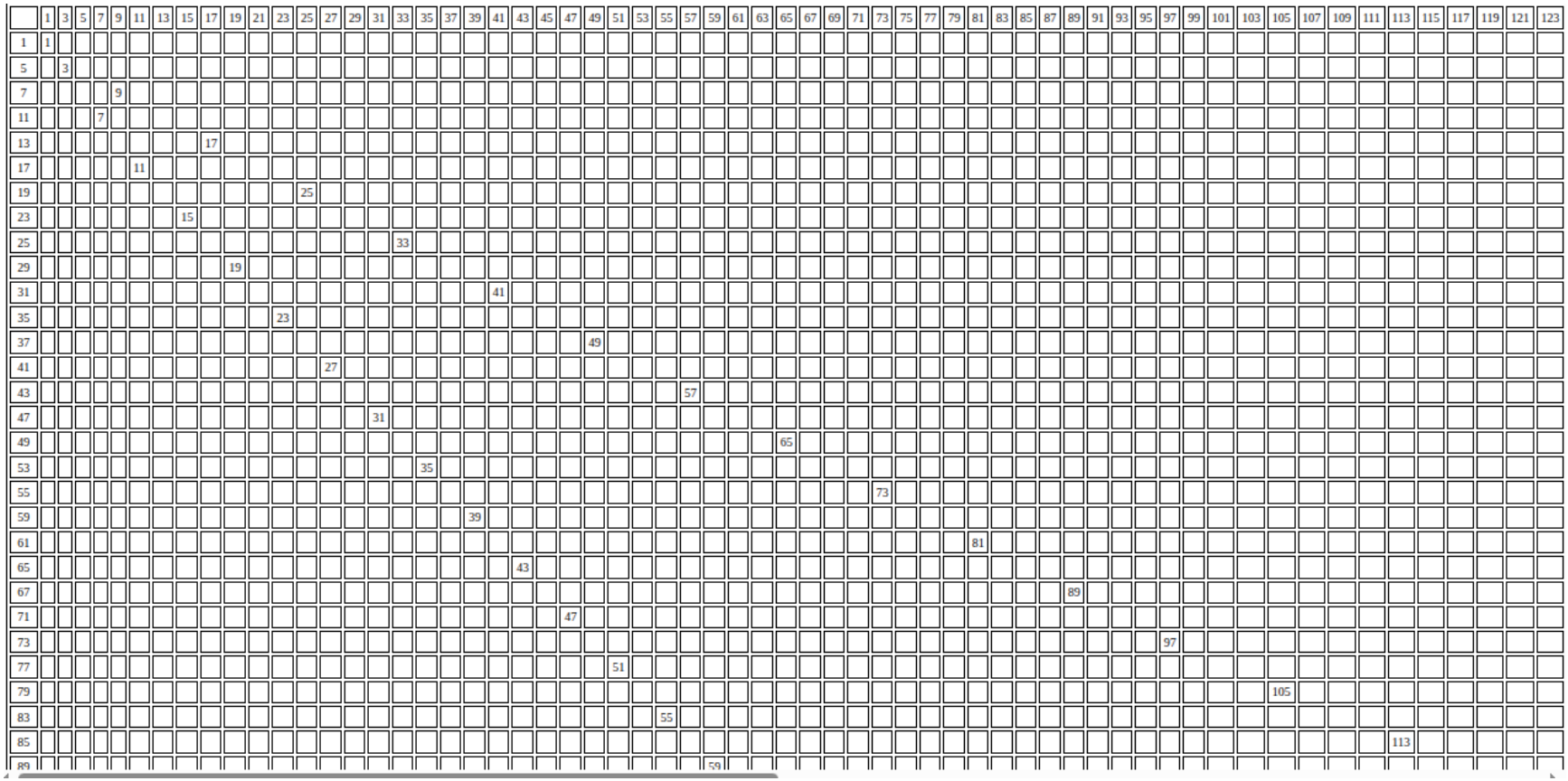

Figure 1: The Murgu Table2To3 mapping structure from $N = 1$ to $N = 201$.