

Solving Chess as a Consequence of a Universal Reasoning Substrate: Toward a Formal DSL for Objectified Reasoning

Eric Robert Lawson

Abstract

This paper argues that the completion of a Domain-Specific Language (DSL) for the Reasoning DNA Unit (RDU) framework will make the formal and verifiable completion of chess inevitable. The argument proceeds by showing how reasoning can be objectified, assimilated, and operationalized to construct a complete structured reasoning space for the game of chess. Once reasoning is representable in manipulable form, the full reasoning structure of chess—its moves, branches, and outcomes—can be systematized, pruned, and completed within a finite reasoning space. This process, though previously considered unfeasible, becomes both conceptually and practically achievable once the DSL is realized.

1 Introduction

The author is currently developing prototype systems that demonstrate partial operationalization of this framework, with ongoing work toward defining a formal DSL capable of expressing and manipulating reasoning objects natively.

Chess has long been regarded as a paradigmatic example of bounded complexity. It is finite, deterministic, and yet combinatorially vast. Despite centuries of exploration, a complete understanding of chess—that is, a provably perfect mapping of all possible outcomes—has remained beyond reach.

This paper presents an argument that the completion of a DSL designed for the universal reasoning substrate fundamentally changes this. Once reasoning can be expressed as structured, manipulable objects, the problem of solving chess transitions from a theoretical impossibility to a practical engineering challenge.

2 From Reasoning Units to Structured Reasoning Space

The Reasoning DNA Unit (RDU) framework formalizes reasoning as composable objects that can be instantiated, assimilated, and operationalized. Each RDU encapsulates a reasoning process, its internal transformations, and its relationships to other reasoning processes.

Within this framework, existing chess game logs can be transformed into RDUs. Each RDU represents a structured reasoning fragment of the chess reasoning space. These fragments can then be assimilated into a larger composite RDU—a semi-structured representation of the entire game.

Automation and algorithmic assimilation enable this reasoning space to grow organically. The system can fill in reasoning gaps, prune nonsensical paths (e.g., games leading to aimless draws), and retain only those trajectories that are consistent with the objective of optimal play. Because the RDU framework allows empirical integration of data, the reasoning space can be incrementally refined using recorded games, theoretical lines, and generated reasoning expansions.

3 Toward a Complete Reasoning Space for Chess

Once a sufficiently structured reasoning space RDU is constructed, a secondary process can be applied: the creation of a perfectly fitted model whose objective is to reproduce and verify the structure of that reasoning space.

In conventional machine learning, overfitting is seen as a flaw—a model’s inability to generalize beyond its training data. Within this reasoning framework, however, the goal is the opposite: to *perfectly fit* the reasoning space. An “overfitted” model to a complete reasoning space of chess would, by definition, constitute a perfect chess model. Its objective function would maximize the number of winning branches while minimizing draws and losses, effectively mirroring the structure of complete understanding.

4 Perfect Play and Reasoning-Space Equilibrium

Once such a model and its reasoning object are constructed, they can be used in self-play to explore the reasoning space. These models would not merely predict outcomes; they would *understand* the structure of the reasoning domain. In this regime, gameplay is no longer stochastic or heuristic but deductive and structural.

When two such complete reasoning-space agents compete, each can determine—at every move—the optimal trajectory of play given full awareness of the reasoning space. Each agent knows when a win is impossible and can therefore choose to draw by force. Over time, as reasoning-space completion progresses, the game of chess would converge toward equilibrium: every possible position can be evaluated in terms of its provable outcomes (win, loss, or draw), and rational agents will always choose the provably optimal path.

In this final equilibrium state, the only viable outcome between two perfect reasoning agents is a draw. The game becomes deterministic at the reasoning level, and its uncertainty is fully eliminated. The question of who could theoretically win reduces to initial advantage (the first-move asymmetry), and once that is established, both agents will converge to the most efficient draw.

5 Consequences and Broader Implications

This reasoning substrate approach does more than solve chess. It formalizes a universal method for constructing complete reasoning spaces within bounded domains. The process of objectifying reasoning into RDUs, assimilating them into structured spaces, and operationalizing them through a dedicated DSL establishes a general path toward the completion of other reasoning domains—including games, formal systems, and potentially scientific or mathematical reasoning tasks.

Chess thus serves as both demonstration and proof of inevitability: once a DSL exists that can manipulate reasoning objects freely, the completion of any finite reasoning space becomes an engineering problem, not a theoretical barrier.

6 Conclusion

The completion of chess is not only possible but inevitable once a DSL for the universal reasoning substrate is realized. Through the formalization of reasoning as manipulable objects, the assimilation of empirical data into a structured reasoning space, and the perfect operationalization of reasoning dynamics, chess transitions from an unsolved domain to a solved reasoning structure.

Every outcome within this space is accompanied by a proof object, providing a precise understanding of a position, its reachable states, and exactly what is possible. This constructs a measurable, solvable vector, allowing chess to be understood as a holistically complete, solved object.

Furthermore, this framework establishes the existence of a class of *perfect strategies*: sequences of moves for which the outcomes are provably forced, and deviations from these sequences are suboptimal. These strategies are not merely theoretical; they are concrete, reproducible, and extractable from the reasoning space, enabling agents to execute them systematically. Perfect agents, operating within this substrate, can follow these strategies to achieve provably optimal play, ultimately converging to draws or forced wins where applicable.

Thus, the resolution of chess extends beyond solving a game—it provides the first empirical demonstration of a universal reasoning substrate capable of constructing, understanding, and completing reasoning itself, while delivering concrete, verifiable strategies that fully exploit the structure of the domain.