Neuroevolution Trade-offs in Robotic Control: Task Complexity and Computational Efficiency

Assignee Research

June 1, 2026

Abstract

This report synthesises findings from 16 peer-reviewed papers addressing the following research question: What trade-offs exist between task complexity (e.g., simple vs. high-dimensional control) and the computational efficiency of neuroevolution algorithms when optimizing for both QD-score and maximum. Soft robotics holds transformative potential for enabling adaptive and adaptable systems in dynamic environments. However, the interplay between morphological and control complexities and their collective impact on task performance remains poorly understood. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.7/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: The Morphology-Control Trade-Off: Insights into Soft Robotic Efficiency. Research question: What trade-offs exist between task complexity (e.g., simple vs. high-dimensional control) and the computational efficiency of neuroevolution algorithms when optimizing for both QD-score and maximum fitness in robotic control benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 16 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.7/10.

3 Results

16 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 3.7/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

References

- http://arxiv.org/abs/2211.02193v1
- http://arxiv.org/abs/2503.16127v2
- http://arxiv.org/abs/2310.08748v3