

数字孪生驱动的工程流程优化白皮书

White Paper on Engineering Process Optimization Driven by Digital Twins

Research White Paper / AIET Research Publication

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AIET

本文件用于智能工程与科技领域的学术交流、专业评审和成果归档。如涉及敏感项目信息，应按照适用的保密和发布要求处理。

This document is prepared for academic communication, professional review, and outcome documentation in intelligent engineering and technology.

摘要

Executive Summary

围绕数字孪生在工程流程优化中的应用，讨论模型建设、仿真验证、方案比较和持续改进机制。

A study of digital twins in engineering process optimization, covering model construction, simulation validation, solution comparison, and continuous improvement mechanisms.

关键观察

Key Observations

- 关注数字孪生在流程建模、仿真验证、过程优化与跨系统协同中的应用价值。
Focuses on the value of digital twins in process modeling, simulation validation, optimization, and cross-system coordination.
- 强调虚实映射质量、数据更新机制、模型可维护性与工程决策支持。
Highlights mapping quality, data update mechanisms, model maintainability, and engineering decision support.
- 为复杂工程流程的可视化分析和优化评审提供方法参考。
Provides methodological reference for visual analysis and optimization review of complex engineering processes.

发布定位

Publication Positioning

本白皮书不以客户案例或商业实施结果作为论证基础，而是以协会研究方向、公开行业议题、专业评审要求及工程应用共性问题为主要分析对象，形成可公开归档和引用的研究型文件。

This white paper does not rely on customer-specific cases or commercial implementation claims. It is based on Association research priorities, public industry issues, professional review requirements, and common engineering application questions, forming a research document suitable for public archiving and citation.

研究范围

Research Scope

- 技术方向** 围绕 数字孪生,流程优化,仿真验证,系统工程等主题，梳理相关工程场景、系统能力和评审关注点。
- 应用边界** 关注可被公开讨论的共性问题，不披露未授权机构数据、客户名称或项目敏感信息。
- 专业目标** 为协会课题成果评审、白皮书质量审核、工程应用案例展示和会员学术交流提供参考。

方法说明

Methodological Notes

- 议题归纳** 结合协会学术委员会关注方向，对行业公开议题和工程共性问题进行结构化归纳。
- 专业审阅** 由相关领域专家依据技术合理性、表达严谨性、应用边界和可引用性进行内部审阅。
- 成果归档** 发布版本作为协会研究白皮书归档文件，用于公开查阅、学术交流和后续成果引用。

使用说明

Use and Citation Notes

公开查阅

本白皮书可供研究者、会员单位、合作机构及行业专业人士用于了解协会研究方向和专业观点。

This white paper may be used by researchers, members, partner institutions, and industry professionals to understand AIET research priorities and professional views.

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发布信息

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